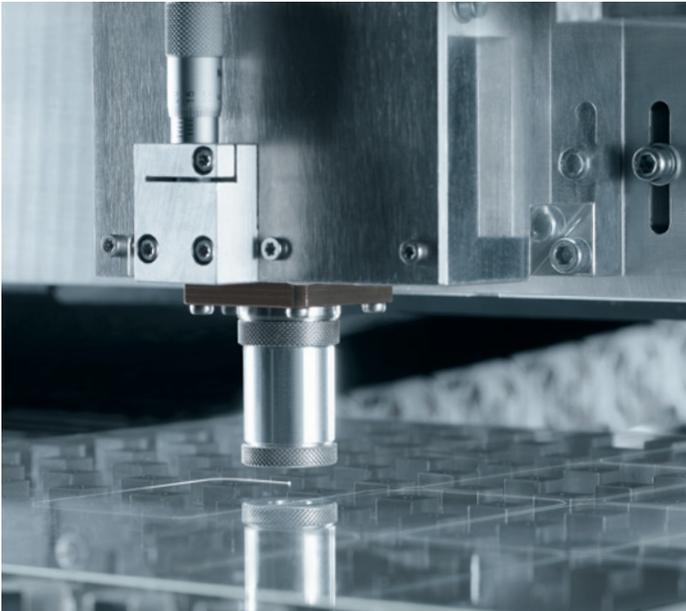




**LASER PROCESSING**



**Laser Processing**  
Key technologies for high-tech production

Labels visible in the interface:  
- ROLL-TO-ROLL  
- PRINTING & COATING  
- WET CHEMISTRY  
- VACUUM COATING  
- METROLOGY  
- AUTOMATION  
- LASER PROCESSING



THE STANDARDS OF TOMORROW GROW FROM THE IDEAS AND ENTHUSIASM OF TODAY



**Manz AG**

Founded in 1987  
 Headquarters in Reutlingen, Germany.  
 Additional locations in Slovakia, Hungary,  
 Italy, China, Taiwan, the United States,  
 and India.

**Employees**

approx. 1,700 employees worldwide,  
 including around 500 engineers

**Core technologies**

Automation  
 Metrology  
 Laser processing  
 Wet chemistry  
 Roll-to-roll

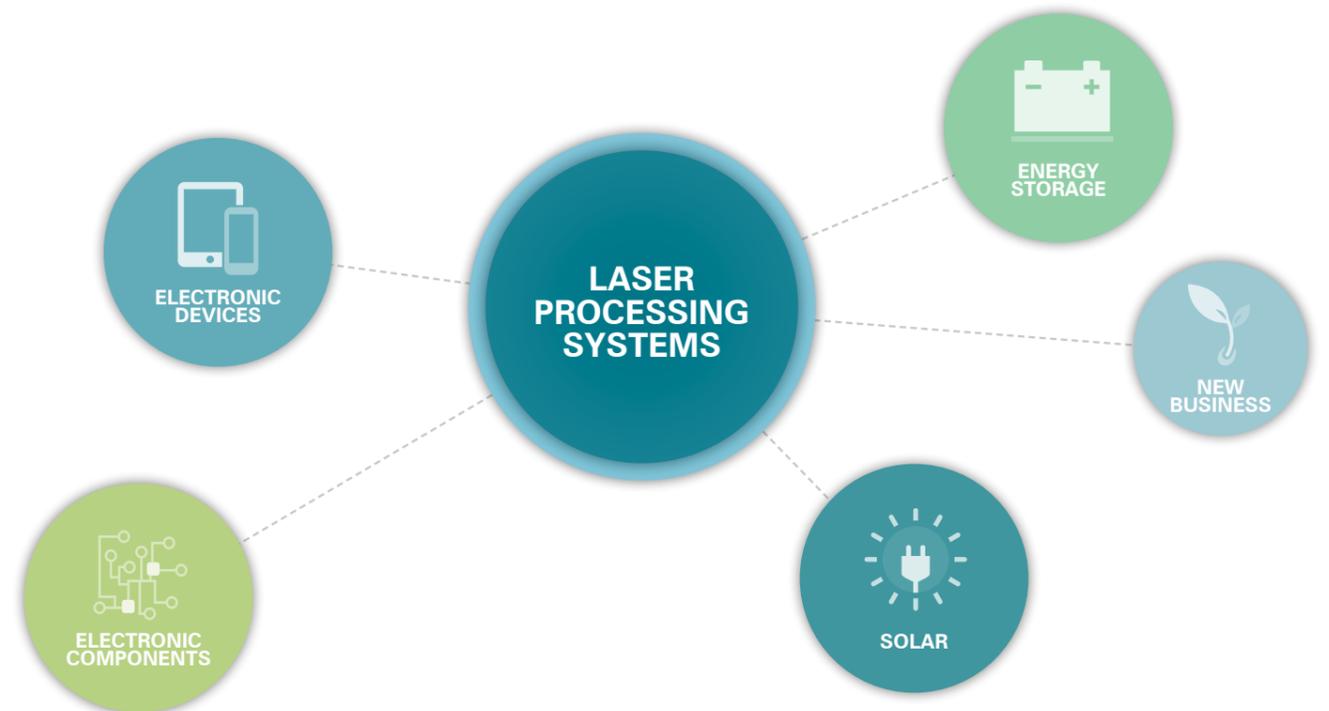
## Laser Processing Solutions for Multiple Industries

With a long-term experience in the field of advanced laser technology solutions, Manz is in a leading position for laser processes in micro-machining for various applications, such as **cutting, scribing and ablating layers like compound semiconductors, metals or dielectric layers.**

In addition to these applications, Manz offers **laser equipment and solutions for drilling, cutting, welding, and ablation of large areas.**

Manz laser tools are well-known for lowest non-productive times due to on-line alignment, loading and unloading in parallel, as well as ease of maintenance.

The modular machine concept and the close cooperation between Manz, leading laser institutes, and laser source and optics suppliers, lead to short delivery times, fast prototyping, and a stable series production.



## Laser Technologies

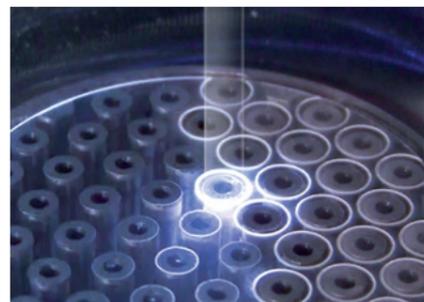
MANZ' EXCELLENT LASER SOLUTIONS MAKE IT POSSIBLE TO ACHIEVE CONSISTENT HIGH QUALITY, HIGH THROUGHPUT, LOW PRODUCTION COSTS AND COMPETITIVE PRICES

### Laser Systems

Whether stand alone laser processing tools or laser processing stations in a fully automated and integrated production system, Manz knows the optimal solution. Regardless the laser process you need, Manz will always provide you with the latest technologies and with processes developed by skilled engineers with expert knowledge.

### Ablation

Laser ablation technologies are used in the production of thin-film solar modules and various other technology fields. Manz provides a complete portfolio of maximum throughput scribes for thin-film ablation on glass or flexible film and for other processes with typical wafer-sized workpieces. For flat and touch panel applications, Manz offers maximum throughput scribes up to sheet sizes of 2.6 m x 2.2 m (Gen. 8.5).



Laser cutting of brittle materials

### Cutting

The Manz laser cutting portfolio covers cutting and slitting of flexible materials such as battery electrodes and separators, cutting of brittle materials such as sapphire, used in electronic devices, cutting of glass (float glass, as well as thermally or chemically strengthened glass), and cutting of sheet metal. Substrate sizes can range from 2" diameter wafers to Gen. 8.5 sheets, while workpiece sizes can range from square millimeters to square meters.

### Drilling

With inline and stand-alone drilling tools for architectural glass and photovoltaic substrates, high throughput special tools for drilling holes in covers of electronic devices, and tools for the perforation of films and foils, Manz covers a wide range of drilling processes for holes and openings with user-defined shapes in either brittle or flexible material.



Tab welding on battery cells

### Welding

Manz has developed highly sophisticated welding processes which allow for unmatched joint qualities at minimized energy input. Welding processes include e. g. micro-joints on support constructions in electronic devices, bi-metallic micro- or macro-joints of battery conductors, and seal welds on battery cans.

### Rapid Thermal Processing (RTP)

Manz provides RTP tools and processes both for coatings used in photovoltaics or on architectural glasses (e. g. TCO) and for coatings used in the display industry for producing flat panels and touch devices (e. g. ITO, Si). Rapid thermal processes can be applied on sheets up to Gen. 8.5 as well as on smaller sheets of individual sizes.

### Integrated Optical Systems

Manz has an exceptional expertise in developing processing heads, needed to master complex laser processes and to overcome workpiece and system tolerances either in-house or in co-operation with renowned system partners.

Manz' customers benefit from in-depth experience and expert know-how in calculating, designing, and building processing optics including one or several features such as internal beam splitting, top hat generation, autofocus, edge/line tracing or compensation of the field curvature of large field telecentric F-Theta lenses.

In addition, big emphasis is laid on an appropriate removal of processing debris or waist in order not only to avoid process perturbations, but also to avoid hazards to the environment or the health and safety of the operating staff.



# Our Locations



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