



**BLS 500**



# *BLS 500* – Battery Laser System

**For laser processes in lithium-ion battery production**



## Battery Laser System *BLS 500* – FOR YOUR OPTIMAL LASER PROCESS



### Manz AG

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

### Employees

Approx. 1,700 employees worldwide,  
of which approx. 500 are engineers

### Core technologies

Automation  
Metrology  
Laser processing  
Wet chemistry  
Roll-to-roll

## *BLS 500* – One machine platform, numerous laser applications

MANZ'S *BLS 500* OFFERS CUSTOMERS A FLEXIBLE LASER SYSTEM THAT COMBINES THE ADVANTAGES OF A STANDARD SYSTEM WITH THOSE OF A CUSTOMIZED SOLUTION.

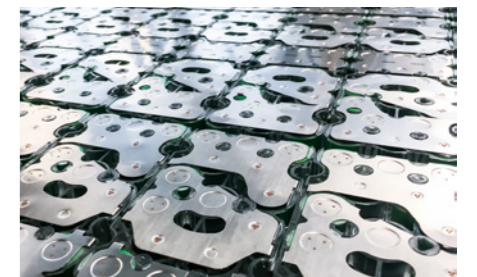
Manz AG is one of the leading suppliers of production equipment for lithium-ion battery cells and battery systems as well as capacitors. We are setting global standards in this field. Manz has many years of laser process expertise and comprehensive know-how in designing optical systems for beam formation, splitting and guidance.

With the *BLS 500*, Manz has developed a flexible laser platform that is designed for different laser processes in the manufacture of lithium-ion batteries. Starting from a standardized machine base, an individual machine configuration can be created in just a few steps to meet the desired application.

Regardless of whether it is a single system with manual charging of the material or a component of a fully integrated production line: The *BLS 500* is always the right choice when it comes to **maximum flexibility, performance, and accuracy** in the production of lithium-ion batteries. The *BLS 500* is the right platform for **high precision laser welding** as well as for **laser cutting, drilling or other partial removal of materials and coatings**. Your advantage: Due to the modular system setup, the *BLS 500* is noted not only for its versatility, but also for its **very appealing overall operating costs**.

The assembly of the modular *BLS 500* from standardized elements allows for **significantly shorter delivery times** in comparison to custom-manufactured systems. This is accomplished without reducing the laser process' performance parameters.

Efficient spare parts management and round-the-clock customer service available to you ensures maximum availability of your laser system and helps you in increasing your manufacturing productivity.



### Laser welding

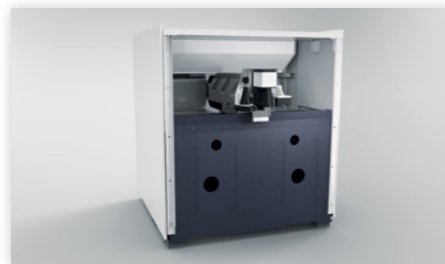
Using the *BLS 500*, li-ion battery cells can be welded into battery packs, or differently shaped battery cans can be welded tightly.





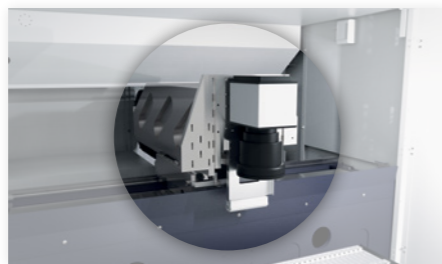
## BLS 500 – Customized in six configuration steps

ONE BASE, MANY OPTIONS: WITH YOUR CONFIGURATION OF THE BLS STANDARD COMPONENTS, WE PROVIDE A HIGH-PERFORMANCE LASER SYSTEM THAT MEETS YOUR INDIVIDUAL NEEDS AND THAT IS CONFIGURED PERFECT FOR YOUR PROCESS REQUIREMENTS.



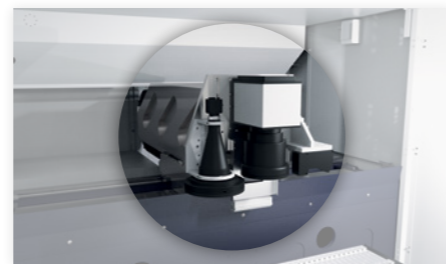
### 01 | MACHINE BASE

- Standard width: 1800 mm
- Other widths upon inquiry
- Standard parts size up to 1000 × 500 × 300 mm
- larger parts upon inquiry



### 02 | PROCESS UNITS

- Galvanometer scanner (mirror based)
- Fixed optics
- Laser sources with varying wave lengths and laser output power up to 6 kW



### 03 | METROLOGY

- Position measurement
- Profile and height measurement
- Focus measurement
- Laser power measurement
- Laser process control



### 04 | AUTOMATION LEVEL

- Table for manually charging with hand crank or servo drive
- Conveyor belt for indexing
- Conveyor belt for retaining device and lifting equipment
- Turntable
- Flexible tensioning system



### 05 | HOUSING

- Laser protection housing with swing doors or slide door
- Laser protection housing for conveyor belt with or without lock







### 06 | OPTIONS

- Ventilation system
- Varying coolant units
- Additional Z axis for process/measuring equipment
- DMC and bar code scanner
- RFID
- Monitor for internal monitoring
- Integration option for shaping and process gas



## BLS 500 – Always the right laser process

THE MANZ BATTERY LASER SYSTEM *BLS 500* IS DESIGNED FOR NUMEROUS LASER PROCESSES. YOU DEFINE YOUR REQUIREMENTS – WE DELIVER THE RIGHT LASER PROCESS. DUE TO THE STANDARDIZATION, YOUR *BLS* CAN BE CONVERTED FOR USE IN ANOTHER PROCESS OR WITH OTHER TOOLS LATER.

 <p><b>01</b></p>	 <p><b>02</b></p>	 <p><b>03</b></p>	 <p><b>04</b></p>	 <p><b>05</b></p>
<p><b>WELDING</b></p> <p>Welding materials with differing material partners</p>	<p><b>MARKING</b></p> <p>Marking texts, codes and samples on wide array of materials</p>	<p><b>DRILLING</b></p> <p>Drilling holes in the widest array of materials</p>	<p><b>CUTTING</b></p> <p>Laser cutting of metals, plastics and compound materials</p>	<p><b>ABLATION</b></p> <p>Partial removal of material and coatings</p>

### IN FOCUS: MANZ LASER WELDING

Laser welding is among the standard processes for the *BLS 500*. Depending on the material and requirements, special welding methods are used by Manz, which are advantageous over customary resistance and ultrasound welding.

#### Areas of use

- Welding same or different metals
- Welding reflective materials (e.g. copper, gold, aluminum)

#### Advantages

- High welding seam strength
- Stable and repeatable welding depths even with adverse material pairs
- High degree of freedom in welding seam geometry and welding seam cross-section

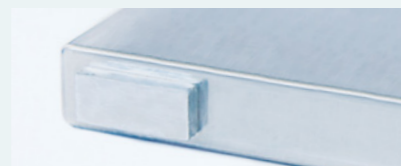


#### LASER WELDING of cylindrical cells

- Overlapping welds of thick upper with thin lower materials
- Micro welds with low thermal influence zone

#### Advantages

- Low thermal load of components/ battery
- No welding through

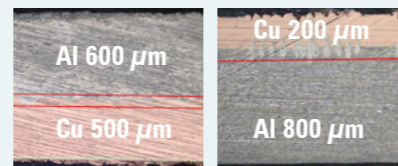


#### LASER WELDING from arrestor connections or seal welds of housings

- Welding thick copper
- Different connection configurations possible

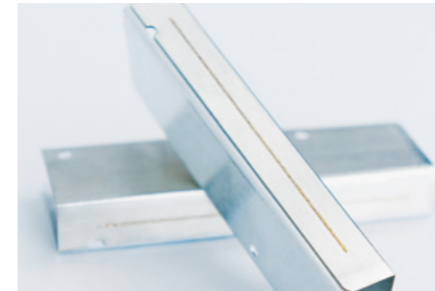
#### Advantages

- Large connection cross-section and tolerance compensation
- High-density connections



In laser welding, different, specially developed processes are used depending on the process and material.

Nearly constant welding depths in the range of a few micrometers can be achieved on the *BLS 500*.



## Your advantages at a glance

THE CONCEPT BEHIND THE BATTERY LASER SYSTEM *BLS 500* COMBINES SEVERAL ADVANTAGES: HIGH PROCESS SAFETY WITH MAXIMUM FLEXIBILITY.



PROCESS SAFETY



QUALITY & EXPERIENCE



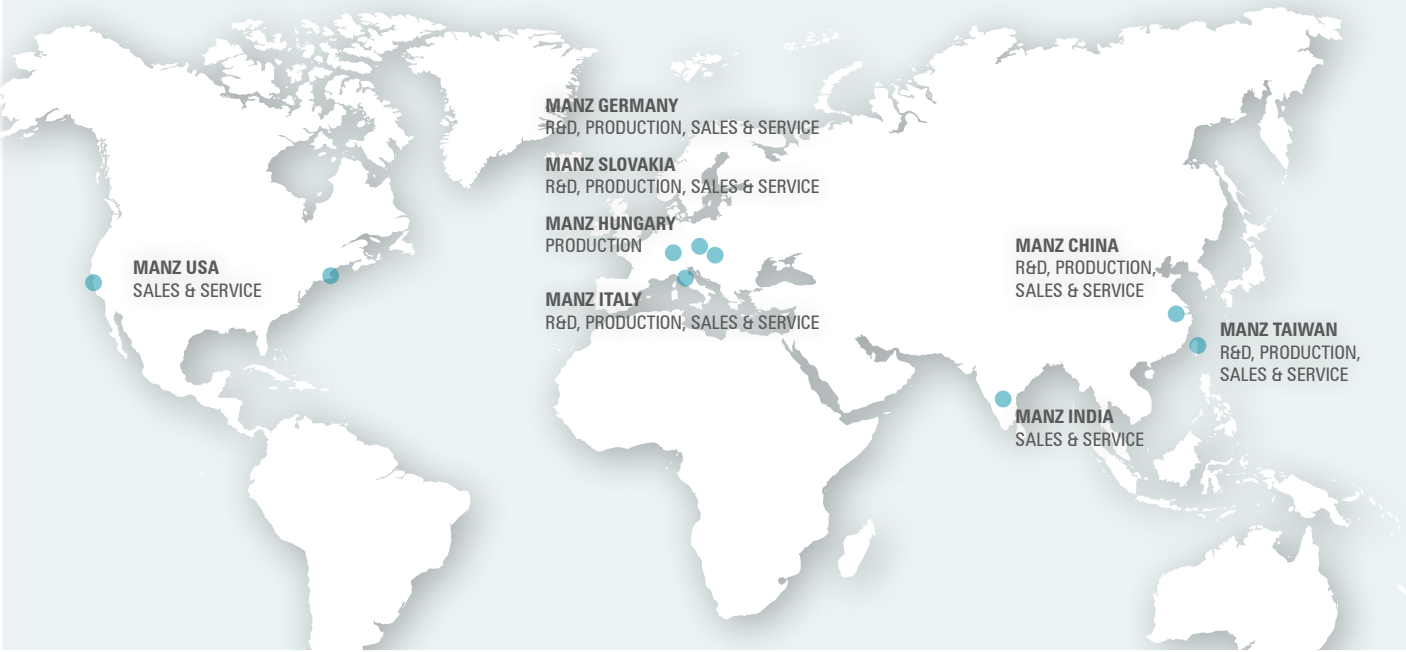
GREATER FLEXIBILITY

The Manz Battery Laser System *BLS 500* is made of high-performance components using a modular principle. A laser system can be configured based on a standardized machine platform and numerous similarly standardized add-on components. Additional options are available upon request so that each system can be adapted each time to the individual use. Our laser applications are noted for high process safety and have been tried in applications for years.

Manz has more than 30 years experience in machine design as well vast process know-how that we would be happy to utilize in developing or optimizing a suitable laser process for your needs.

The *BLS 500* can be used as a machine for small facilities and pilot projects as well as for systems used in mass production, integrated into (existing) automation. By using standardized components, the laser process can be adapted to new demands or the housing can be refitted in the future. Thus, they remain flexible into the future.

# Our Locations



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