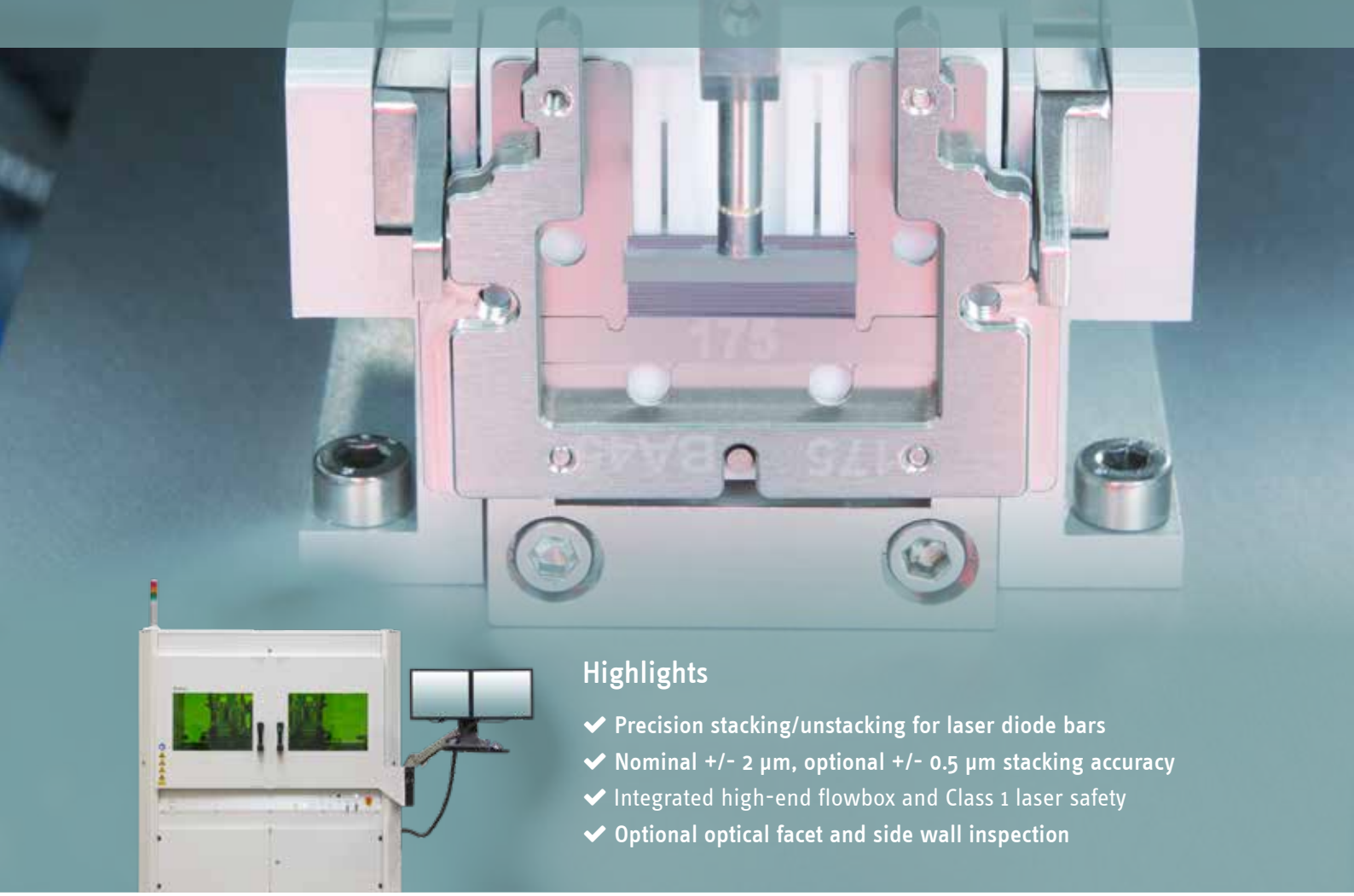
STACKLINE

High-precision laser chip stacking & unstacking

Fully automated precision stacking/unstacking for semiconductor laser diode bars. Typically used in preparation for a coating process and/or for post-process unstacking and optical inspection of facet and side walls (optional). Configurable as a stand-alone or as an in-line assembly cell.



Highlights

- ✔ **Precision stacking/unstacking for laser diode bars**
- ✔ **Nominal +/- 2 µm, optional +/- 0.5 µm stacking accuracy**
- ✔ Integrated high-end flowbox and Class 1 laser safety
- ✔ **Optional optical facet and side wall inspection**

PHOTONICS AUTOMATED ASSEMBLY AND TESTING
FROM LAB TO FAB

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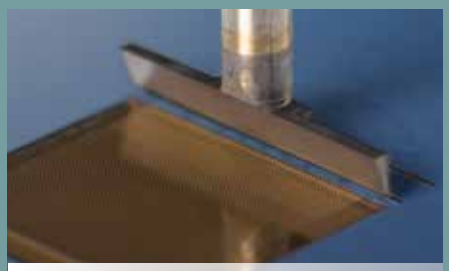
Fully automated semiconductor device stacking and unstacking

StackLine systems have been uniquely designed to provide fully automated device stacking and/or unstacking capabilities. This is realized by drawing together selected capabilities from the ficonTEC packaging toolbox – our ubiquitous machine vision system referencing and component recognition/handling, AssemblyLine's passive alignment routines, and TestLine's AI-based defect recognition facet inspection procedures. Seamlessly managed by a common process-oriented control interface, the result is an industry qualified and flexibly programmable stacking/unstacking system that continues to see wide usage.

Stacking is typically required in preparation for coating (sputtering) processes, with subsequent post-process unstacking and inspection of facets and (optional) side walls. These systems are compatible with all high-precision, flush or staggered spacer diode bar stacking and unstacking needs. Although primarily available as versatile and highly capable stand-alone cells, they can also be configured as in-line process cells for volume production lines. The latest updates include optional AI/ML-based process monitoring hardware and software add-ons to ensure minimal downtime.

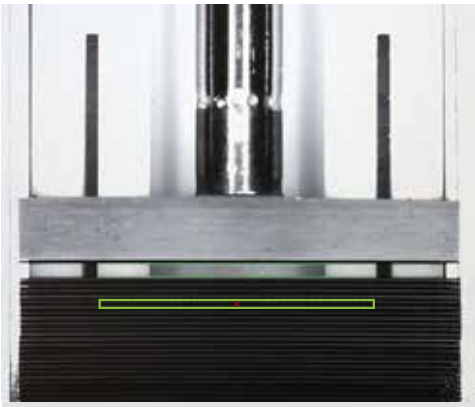

Vacuum pick-up of laser bar from blue tape


Optional optical facet inspection


Aligning fast-axis lenses onto stacked bars

Software control

PCM is ficonTEC's unified process-oriented control interface that ships with all turn-key stand-alone systems and multiple machine configurations. PCM features an intuitive UI and an up-to-date feature set that includes all machine vision, high-resolution positioning, system management software and test routines required to reliably and repeatably drive passive/active alignment and bonding process hardware.

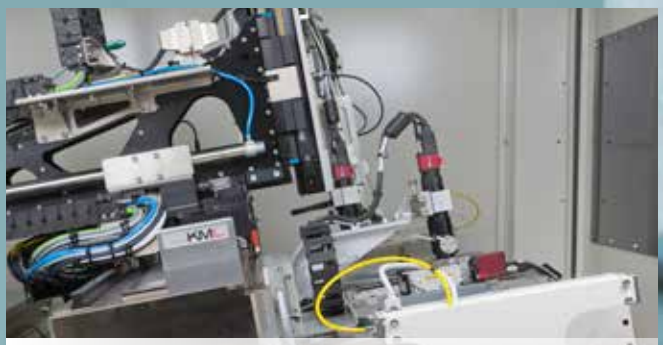

Precise stack process control to +/- 0.5 µm

STACKLINE
High-precision laser chip stacking & unstacking

PHOTONICS AUTOMATED ASSEMBLY AND TESTING
FROM LAB TO FAB

General tasks & applications

- Precision stacking of flush/staggered laser bars
- Suitable for bare singulated laser bars up to 20 mm
- Bar stacking in preparation for coating
- Device sorting from singulated wafers
- Unstacking and inspection of coated LD stacks



Tilted system set-up provides for excellent stacking results

Key features

- High-precision motion referencing and alignment
- Pick-&-place from/to standard/custom carrier formats
- Nominal +/- 2 µm, optional +/- 0.5 µm alignment accuracy
- Optional dimensional checking, full facet inspection
- Integrated flowbox, electrostatic protection, Class 1 safety

STACKLINE in high-power diode bar preparation

High-power laser diode bars find myriad application in materials processing and as medical lasers. The so-called wall-plug efficiency can be improved, for example, by high-quality facet passivation (coating), giving higher optical intensity and brightness at superior electrical characteristics.

Modular & (re-)configurable

- State-of-the-art die and carrier handling options
- Flexibly scalable to suit needs 'From Lab to Fab'
- Operate, monitor and sync parallel lines remotely
- Add or swap modules to re-configure & re-purpose

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PHOTONICS AUTOMATED ASSEMBLY AND TESTING
FROM LAB TO FAB

MANUFACTURING MADE LIGHT

Solutions for integrated photonics. Built to scale.

ficonTEC is the global market leader for automated assembly and test solutions for modern optoelectronics and integrated photonic devices. In serving development and manufacturing needs for telecom/datacom interconnects, sensors & lidar, camera modules, high-power diode lasers and many other integrated applications for over 20 years, ficonTEC's suite of process capabilities is unmatched.

Additionally, a unique and modular approach to production equipment design means that each solution is the automated and optimized embodiment of a customer-defined process.

Contact us

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Core system specifications	 S1200	 S2000
Motion system	multi-axis high-precision alignment	
Device handling	unstacking **ONLY** pick-&-place to Gel-Pak, Waffle Pack, custom	stacking/unstacking pick-&-place from/to Gel-Pak, Waffle Pack, blue tape, custom
Temperature control	temperature-controlled chuck, +15 to +80 (+/- 0.1) °C	
Load options	manual loading and/or single conveyor	
Feed options	suitable for Jedec or Auer boats, or for customer trays	
Machine vision	system referencing and observation camera options | device and I/O port referencing	
Software features	flexible and powerful process programming | extended operator-less control | Windows 10 PC	
Minimum connections	120 VAC (or country specific) | air/vacuum | 100 Mbit/s network	
Cleanroom compliance	ISO 6**	
Physical features	rugged steel base production cell | integrated flowbox for ISO 7 conditions at working area	
Dimensions (w x b x h, mm)	1200 x 1200 x 2000	1800 x 1200 x 2000
Weight (typ., kg)	1800	2500

** others available on request

- All ficonTEC systems are compatible with PXI-based electro-optical instrumentation modules and leveraging of NI's LabVIEW™. Non-LabVIEW and alternative instrumentation environments are also compatible.
- In addition to all driving align-&-attach processes, PCM software also includes AI-based Deep Learning defect recognition capability, optional ML-oriented production data monitoring, and can direct call functions in Python files.
- Special purpose cells, robotic systems as well as some TESTLINE functionality can be flexibly incorporated to suit customer needs.

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