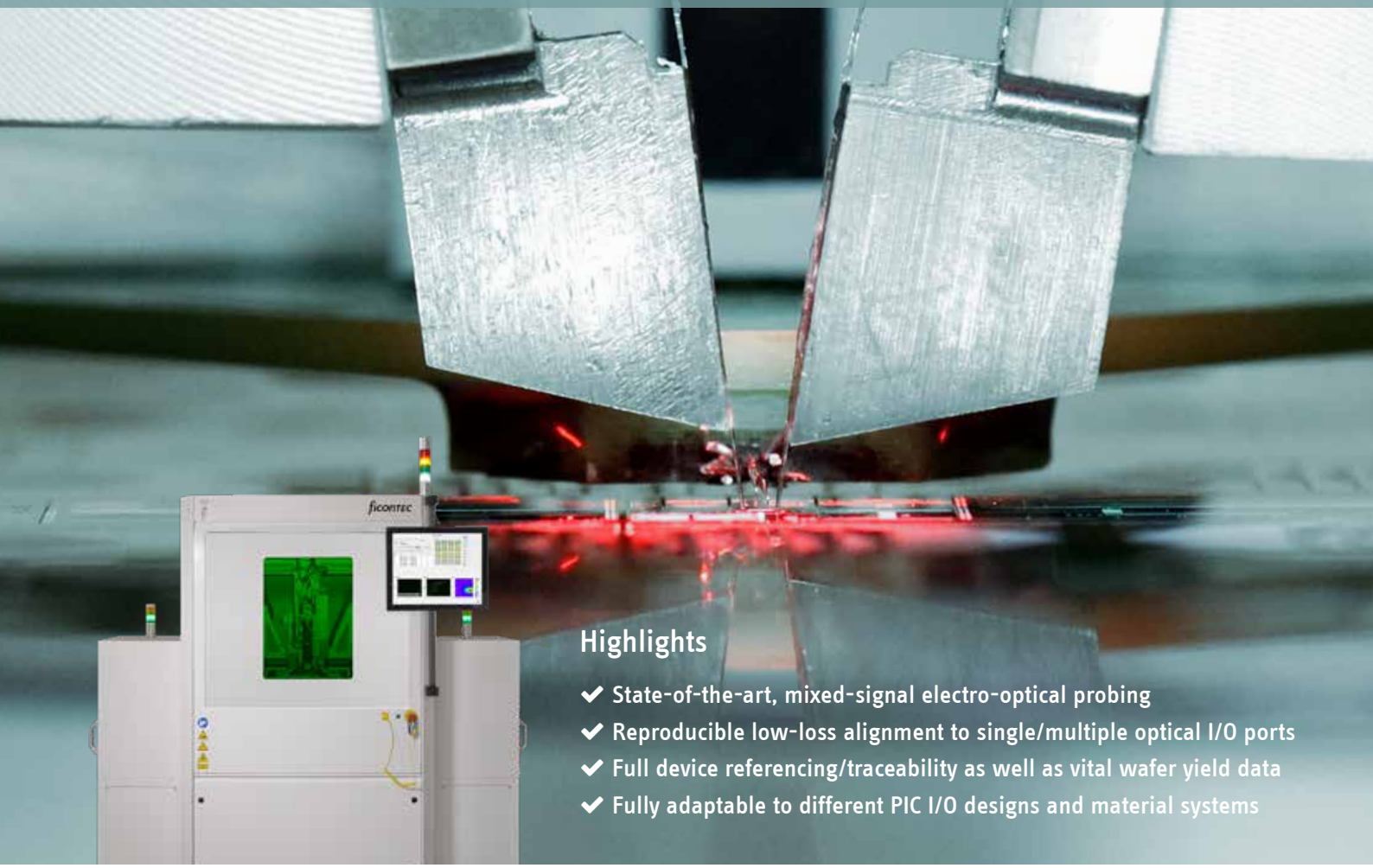
MANUFACTURING MADE LIGHT
Solutions for integrated photonics. Built to scale.

WAFER TESTLINE
Wafer-level photonic device test

Innovative mixed-signal electro-optical test systems for non-singulated photonic integrated circuits (PICs) and other optoelectronic devices. Featuring fully automated DC, RF and optical measurements both on-wafer and for single photonic devices on appropriate carrier formats.



Highlights

- State-of-the-art, mixed-signal electro-optical probing
- Reproducible low-loss alignment to single/multiple optical I/O ports
- Full device referencing/traceability as well as vital wafer yield data
- Fully adaptable to different PIC I/O designs and material systems

PHOTONICS AUTOMATED ASSEMBLY AND TESTING
FROM LAB TO FAB

ficontec
photonics assembly & testing

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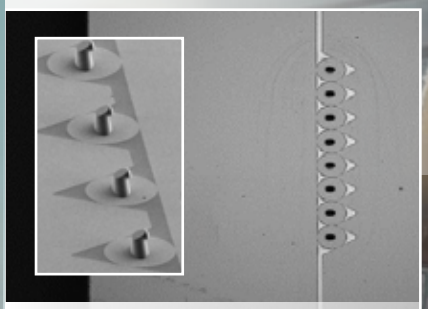
Fully automated electro-optical test of wafer-level devices

ficonTEC's Wafer Testline product line is specially designed as a versatile electro-optical test-&-measurement system platform for wafer-level photonic device test, but also work equally well for multiple singulated devices on appropriate carrier formats.

For R&D proof-of-concept device test tasks, Wafer Testline provides state-of-the-art, multi-channel e/o test of on-wafer waveguide and PIC I/O. Custom 3D-printed fiber tips provide support for edge-coupling, so low-loss coupling is enabled for all optical coupling mechanisms. A re-configurable probe-wafer layout even caters to multiple PIC designs on a multi-project wafer (MPW).

For volume manufacturing, all identical devices on a wafer can be tested fully automatically. Built-in device cataloging and traceability enable yield and performance data across entire wafers, resulting in extremely valuable and previously unattainable feedback for the wafer fabs

I/O optical channel recognition via machine vision



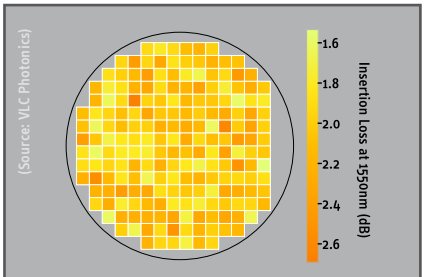
3D-printed fiber probe tips for edge-coupling

(Source: VLC Photonics)

Multi-channel optical I/O coupling to on-wafer devices

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.



Wafer-scale device mapping of an SOI waveguide

Wafer Testline
Wafer-level photonic device test

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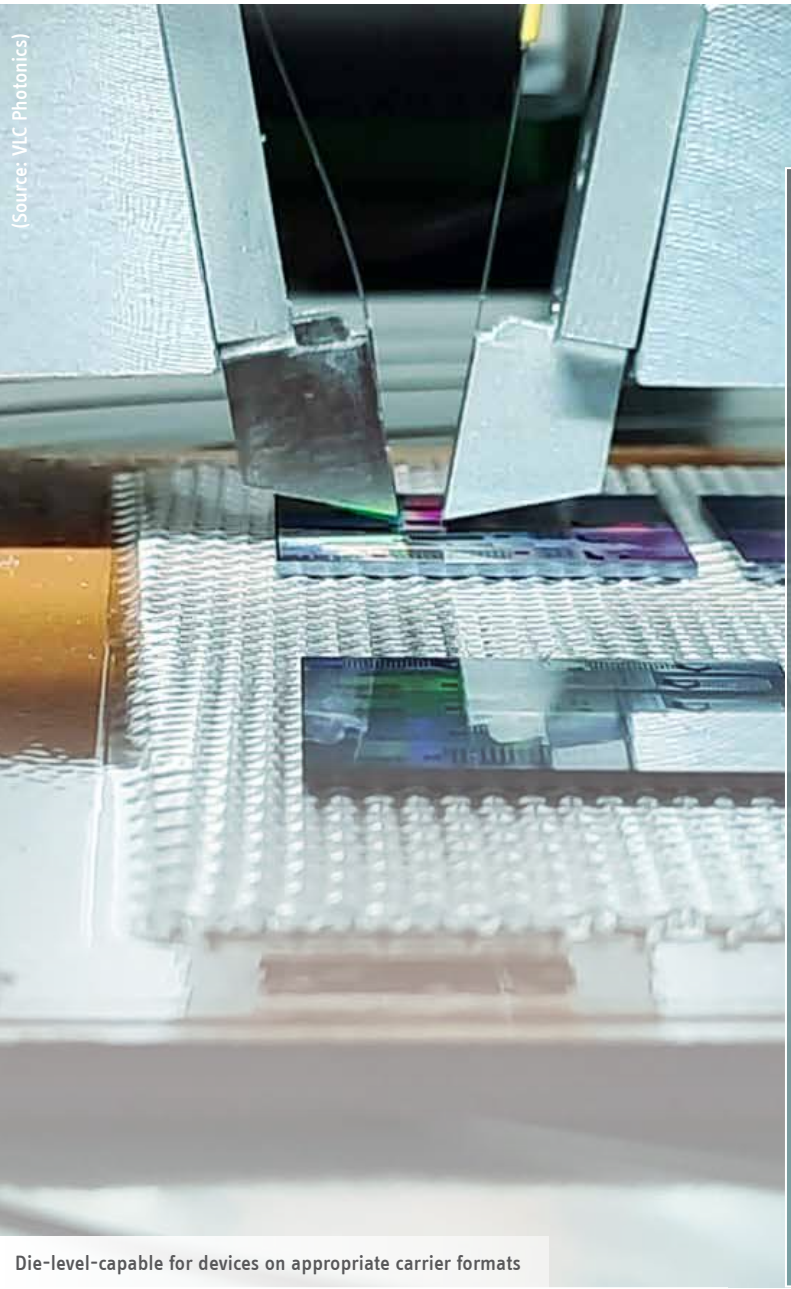
(Source: VLC Photonics)

Die-level-capable for devices on appropriate carrier formats

Key features

- Automated I/O port referencing to sub-µm accuracy
- Vertical and edge alignment to I/O ports in max. 4s
- Low-loss I/O port coupling with < 0.4 dB repeatability
- MPW-capable due to adaptable probe-wafer layout
- Wafer fabs receive PIC yield data across entire wafer

General tasks & applications

- Automated test-&-qualify for passive/active devices
- Proof-of-concept and low-complexity volume e/o test
- FTTX transceivers, MOEMS and sensor assemblies
- Camera modules, 3D scanning & lidar, PICs & silicon photonics
- Configurable for high-complexity copackaged applications

Modular & (re-)configurable

- State-of-the-art 4” to 12” wafer handling options
- Optional modules expand operational functionality
- Flexibly scalable to suit needs ‘From Lab to Fab’
- Add and/or swap modules to re-configure & re-purpose

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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	 WT800	 WT1200	 WT1600	 WT2000
Motion system	single optical probing with 6-axis high-precision alignment* electrical probing with 3-axis alignment	multiple optical probing with 6-axis high-precision alignment* electrical probing with 3-axis alignment		
Wafer table	up to 4" wafers (+/- 100° rotation only)	up to 12" wafers (+/- 100° rotation + xy translation)		
Temperature control	temperature-controlled chuck, +15 to +80 (+/- 0.1) °C			
Handling options (wafer)	manual loading		manual loading or wafer feed system	
Handling options (die)	manual loading		automated loading	
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			
Dimensions (w x b x h, mm)	800 x 1200 x 1600/2000	1200 x 1200 x 2000	1600 x 1200 x 2000	1800 x 1200 x 2000
Weight (typ., kg)	1300	1800	2300	2500

* alternative multi-axis configurations optional ** 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.

WT-2501-V1-en