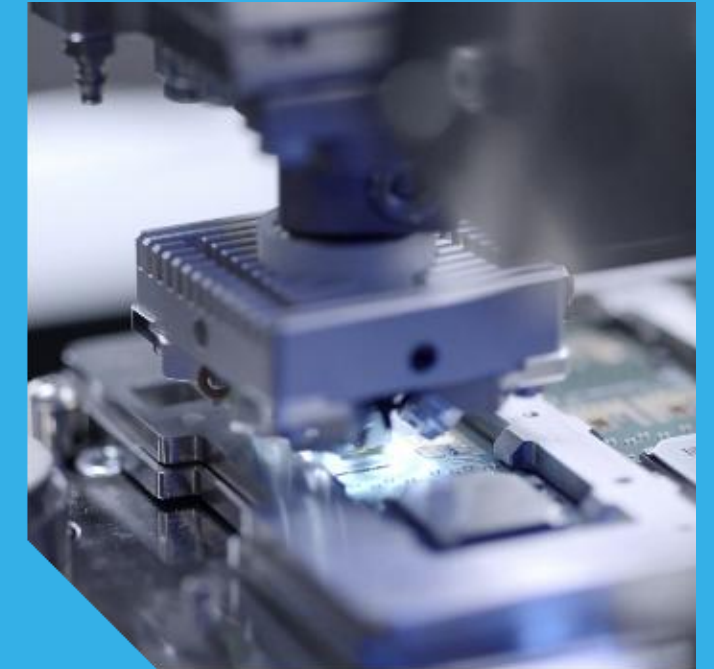




From Lab to Volume

What Advanced Packaging Actually Requires

Sylvain Dulphy, Finetech GmbH & Co. KG
Sep 23, 2026 – EPIC TechWatch at ECOC 2026, Málaga

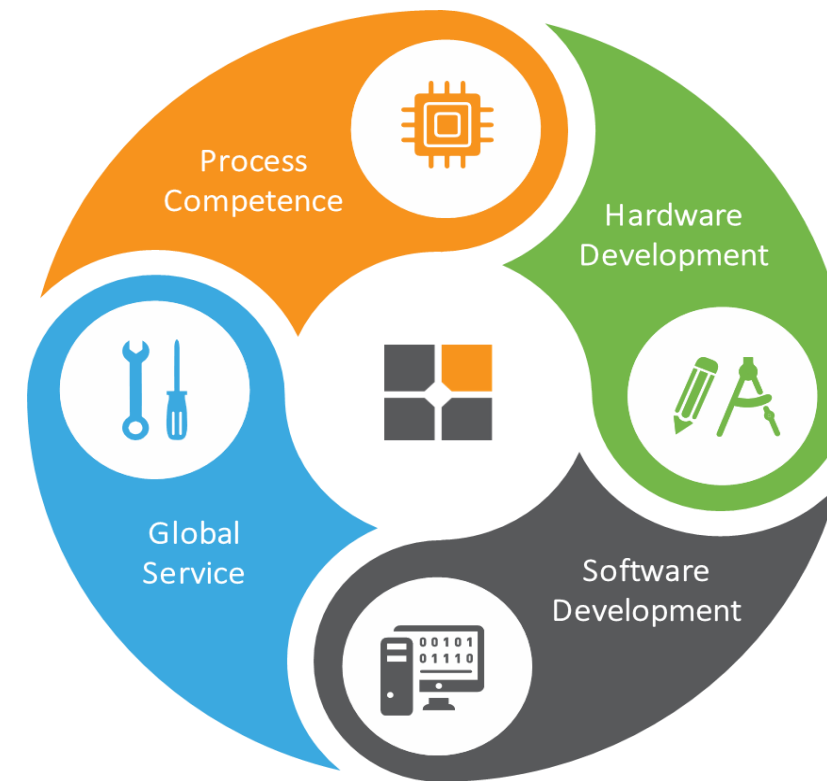


About Finetech

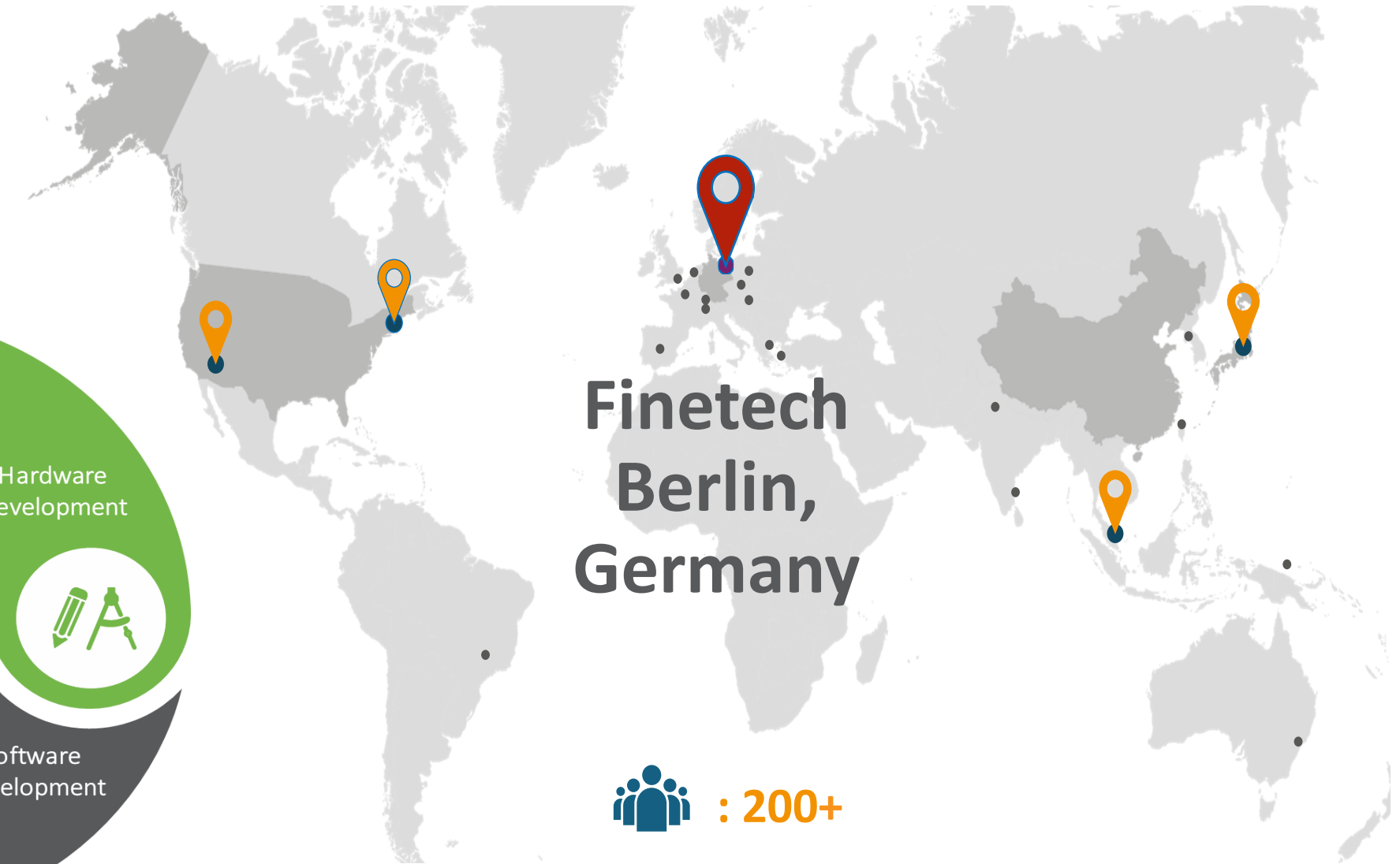
Leading manufacturer of sub-micron die bonding equipment



Die bonders from
prototype to production



High level of vertical integration



Nearly 35 years of experience,
globally active today

Finetech - a company with global reach

Semiconductors & Microelectronics



Defense & Aerospace



Photonics, Optics & Lasers



Quantum Technologies & Advanced Physics



Academics / Institutes & Labs



Healthcare & Life Sciences

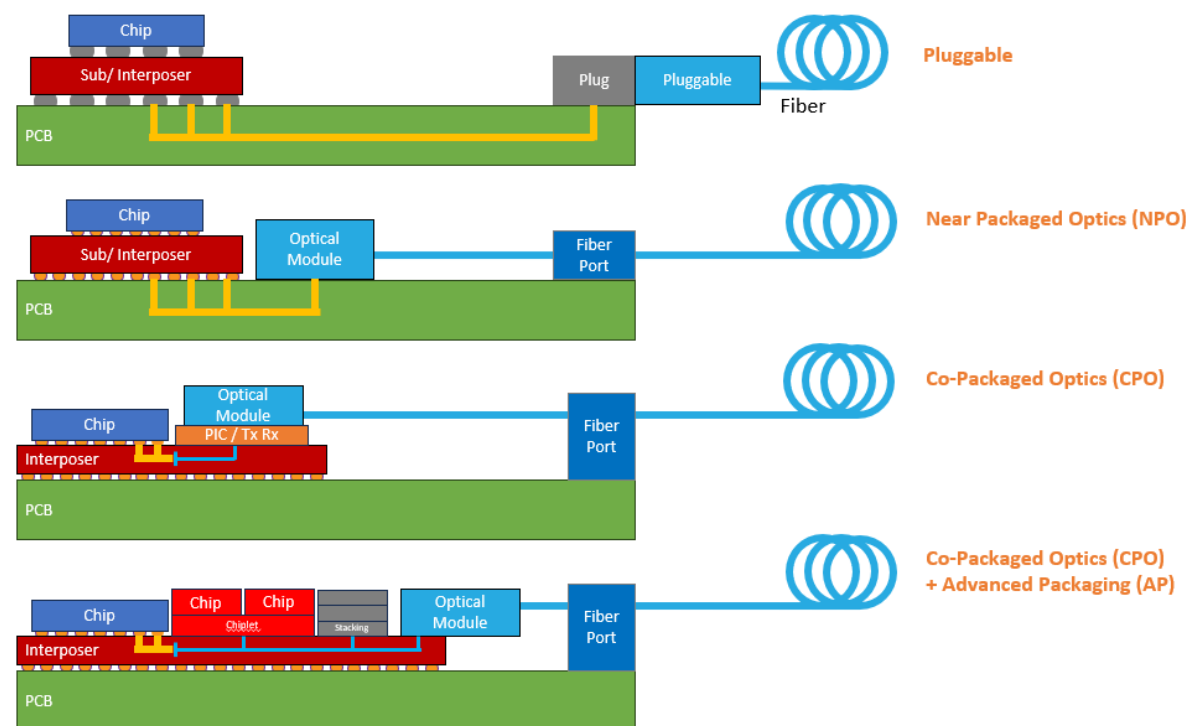


Industry Transition

Toward wafer-level integration

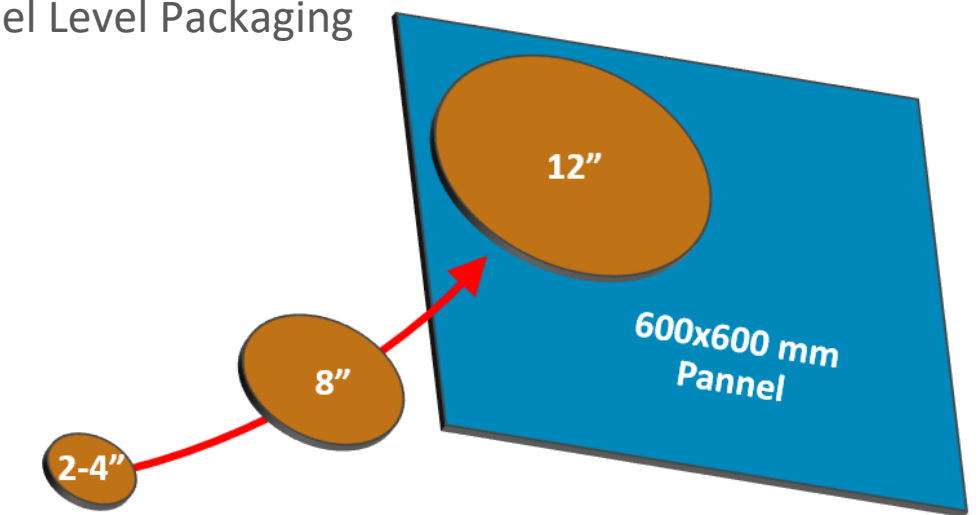
Electronics and photonics grow together

High Degree of Bonding/ Assembly / Packaging Technology Variation



Scaling demands wafer-level thinking

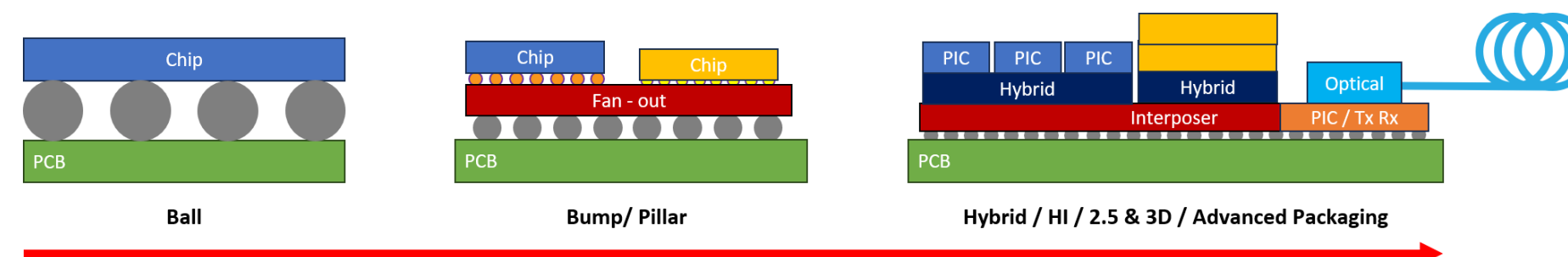
Full Automation &
12" Wafer / 600 mm Panel Level Packaging



Scaling
Bottleneck

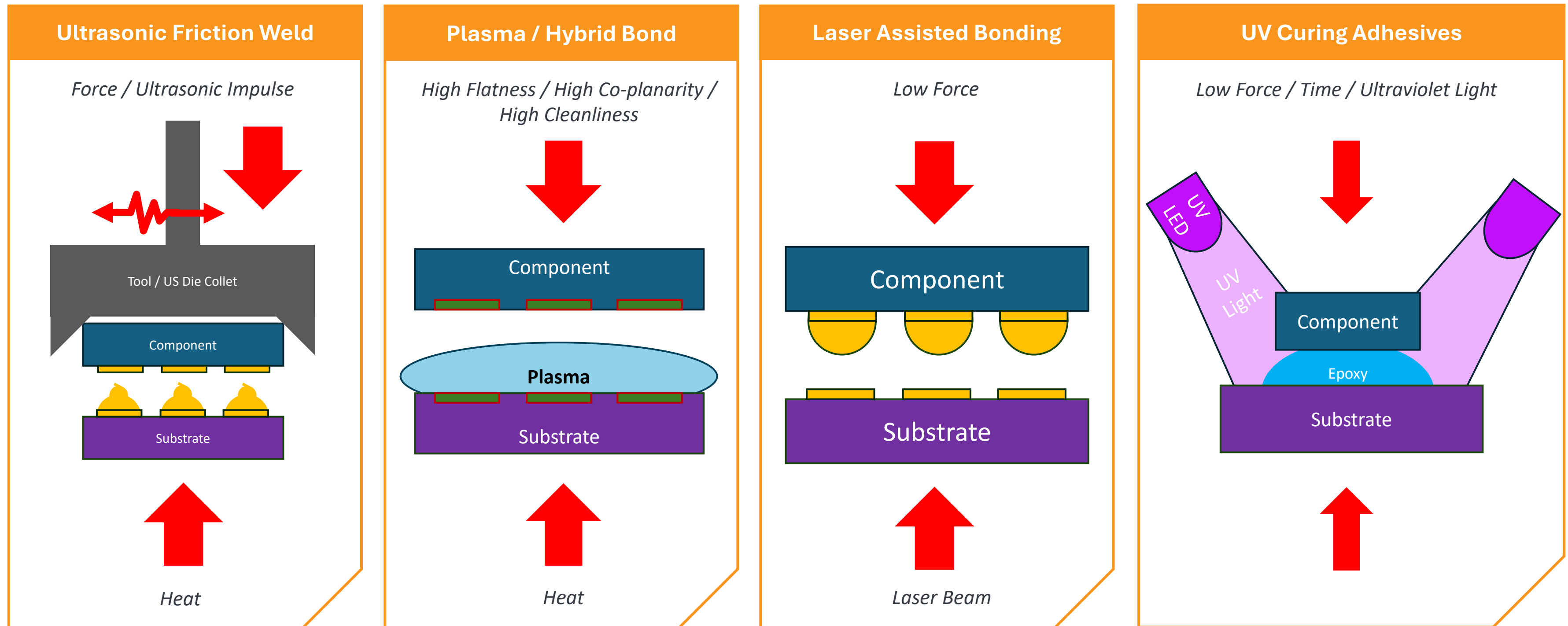
New processes. New equipment. New standards.

Higher Interconnect Density. Higher Bandwidth. Higher Packaging Complexity.



Not One Bond Fits All

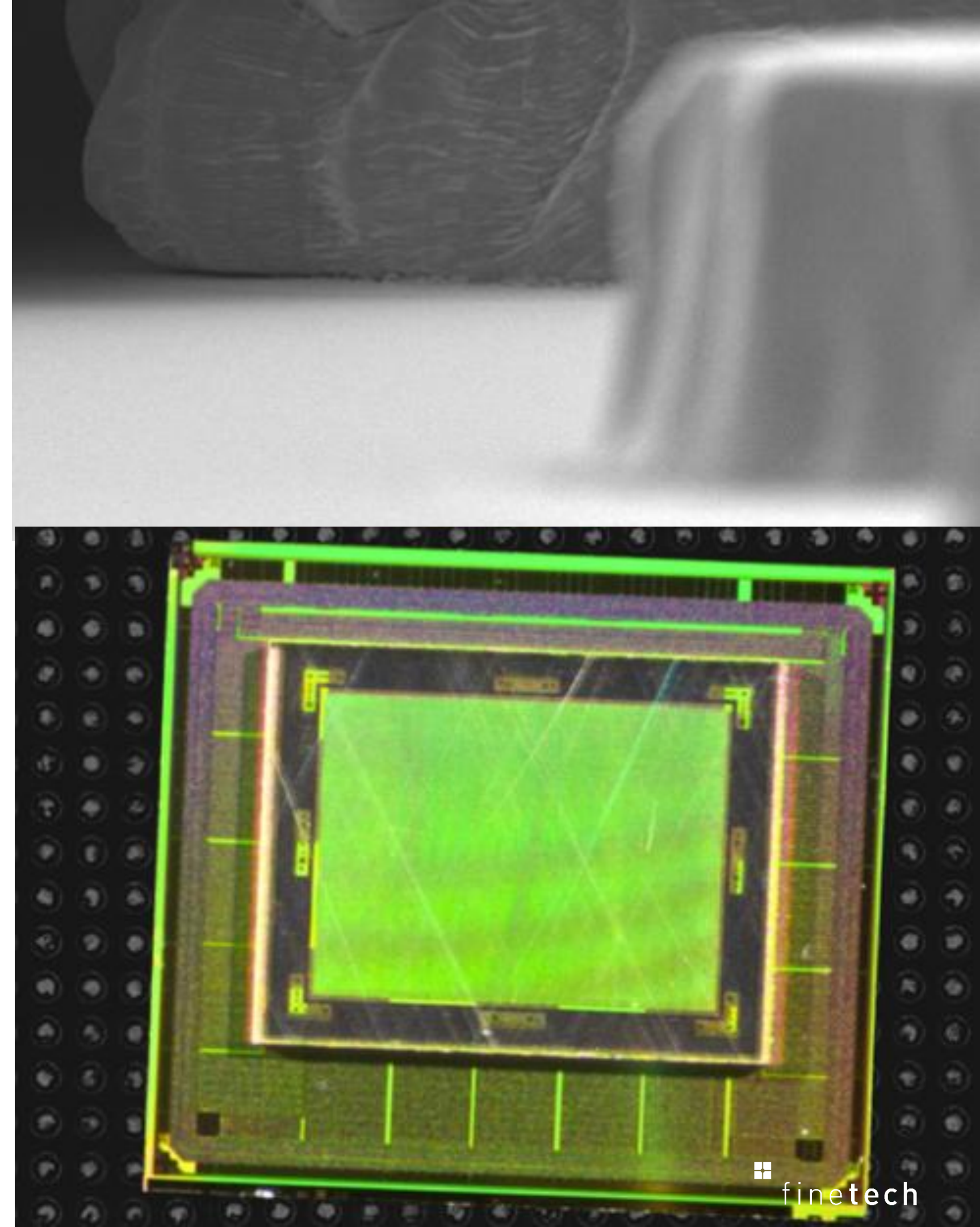
Advanced integration requires a portfolio of bonding technologies



Advanced Packaging Requirements

Material & integration

- **Dissimilar materials**, CTE, stiffness and oxidation differences threaten alignment and reliability
- **Many bonding technologies**
- **Mixed die formats** and **rising interconnect density**



The Added Challenge Is Scaling

Why do processes not transfer?

- Most processes **fail in the transfer to production**, not in the lab
- Where **photonics meets electronics**, it's a handoff, not a handshake
 - Every handoff between tools, software and teams adds variation
- A second development **loop costs time, wafers and yield**, twice over



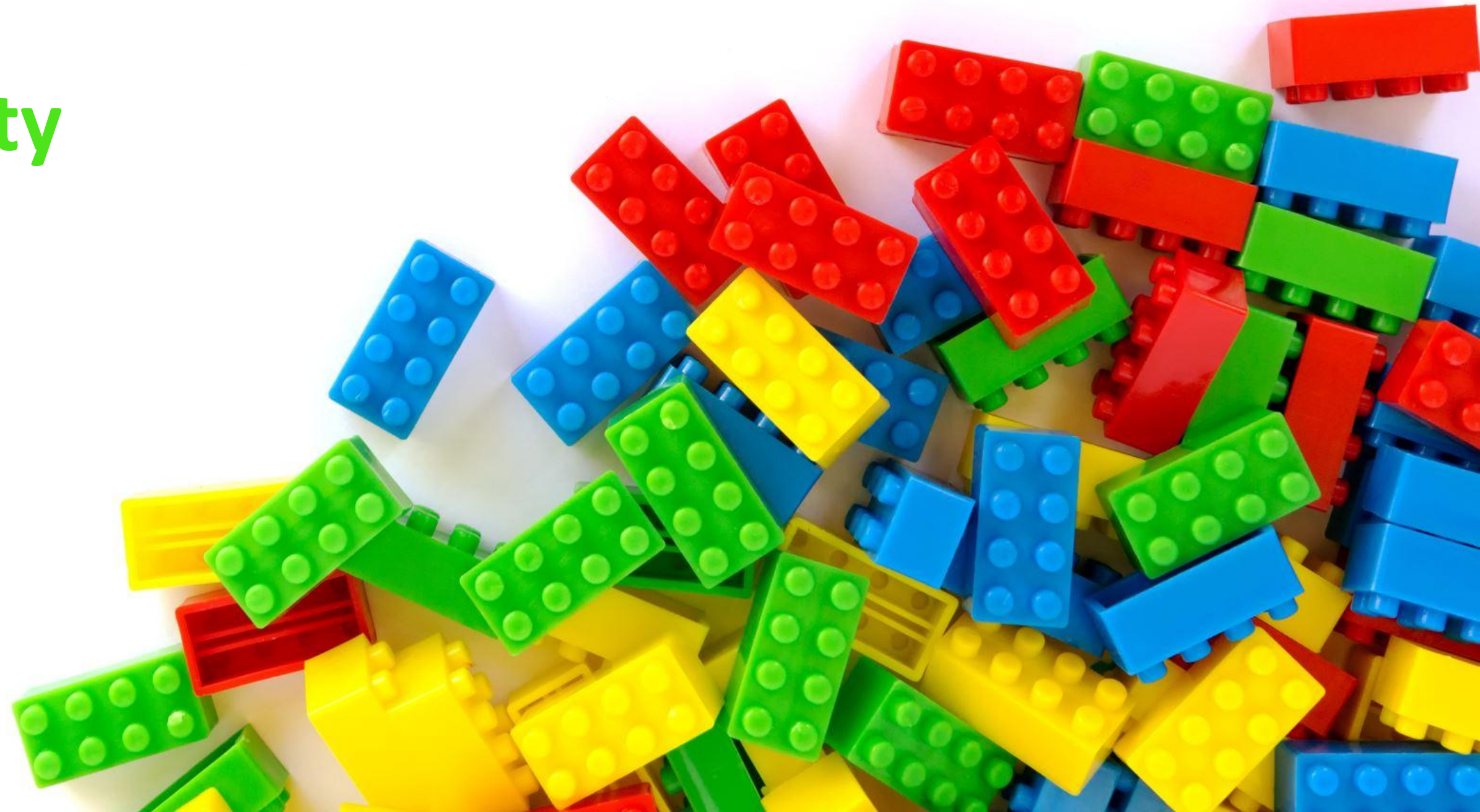
From Lab to Volume

How to transfer your processes into manufacturing?

complexity

density

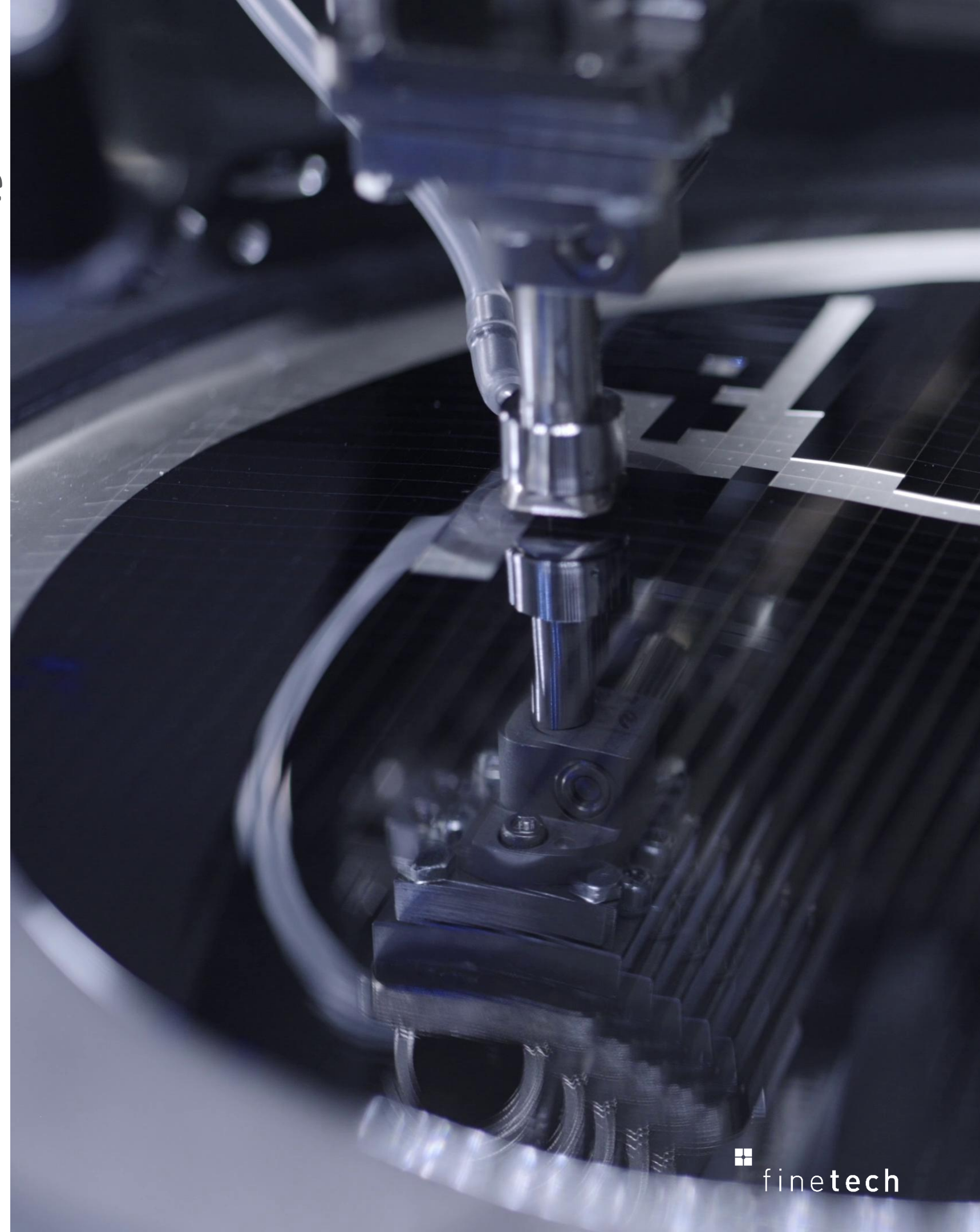
scale



The Need

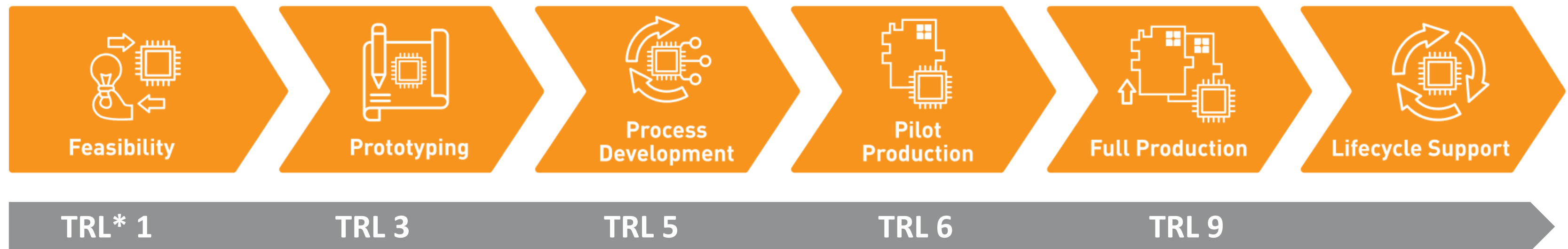
Equipment and processes built to scale

- **Universal process**
→ does not fit the ever-growing variability of materials
- **Able to handle variety**
- **Minimize industrial risks**
- **Scale from few units to a million** without changes



De-Risk Your Advanced Integration Journey

From idea to scalable production, faster time-to-market



Methodology and anticipation

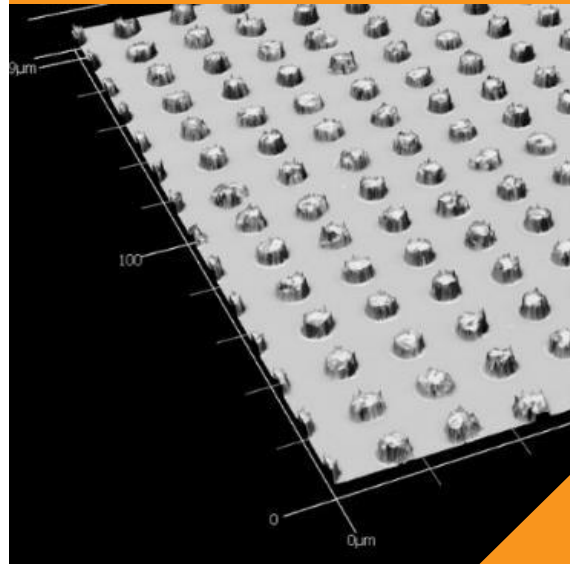
**A unified die bonding
platform ensures
continuity from
prototype to production**



Multi-bonding capability

Adaptable in every process step

Indium Bump
Interconnect



Thermo-
compression
Bonding



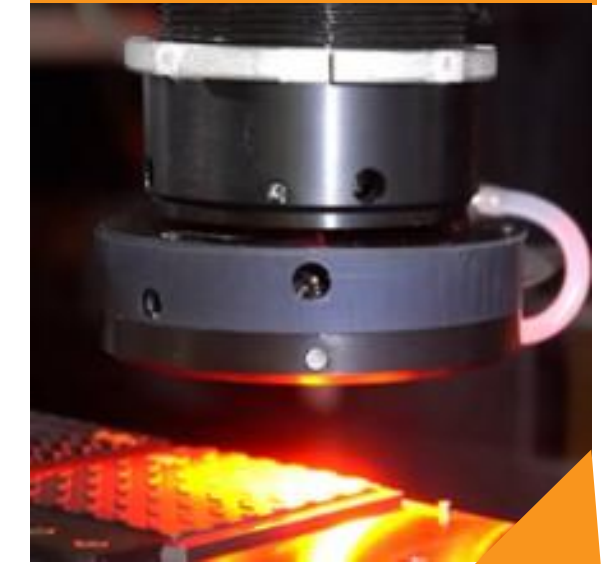
Adhesive Bonding



Ultrasonic /
Thermosonic
Bonding



Reactive
Soldering/ Eutectic
Bonding



Plasma Treatment
Module

Bonding Force Module

UV Curing Module

Ultrasonic Module

Laser Activation Module

Formic Acid Module

Chip Heating Module

Dispense Module

Process Video Module

Substrate Heating
Module

Powered by a wide range of available process and technology modules*

* selection

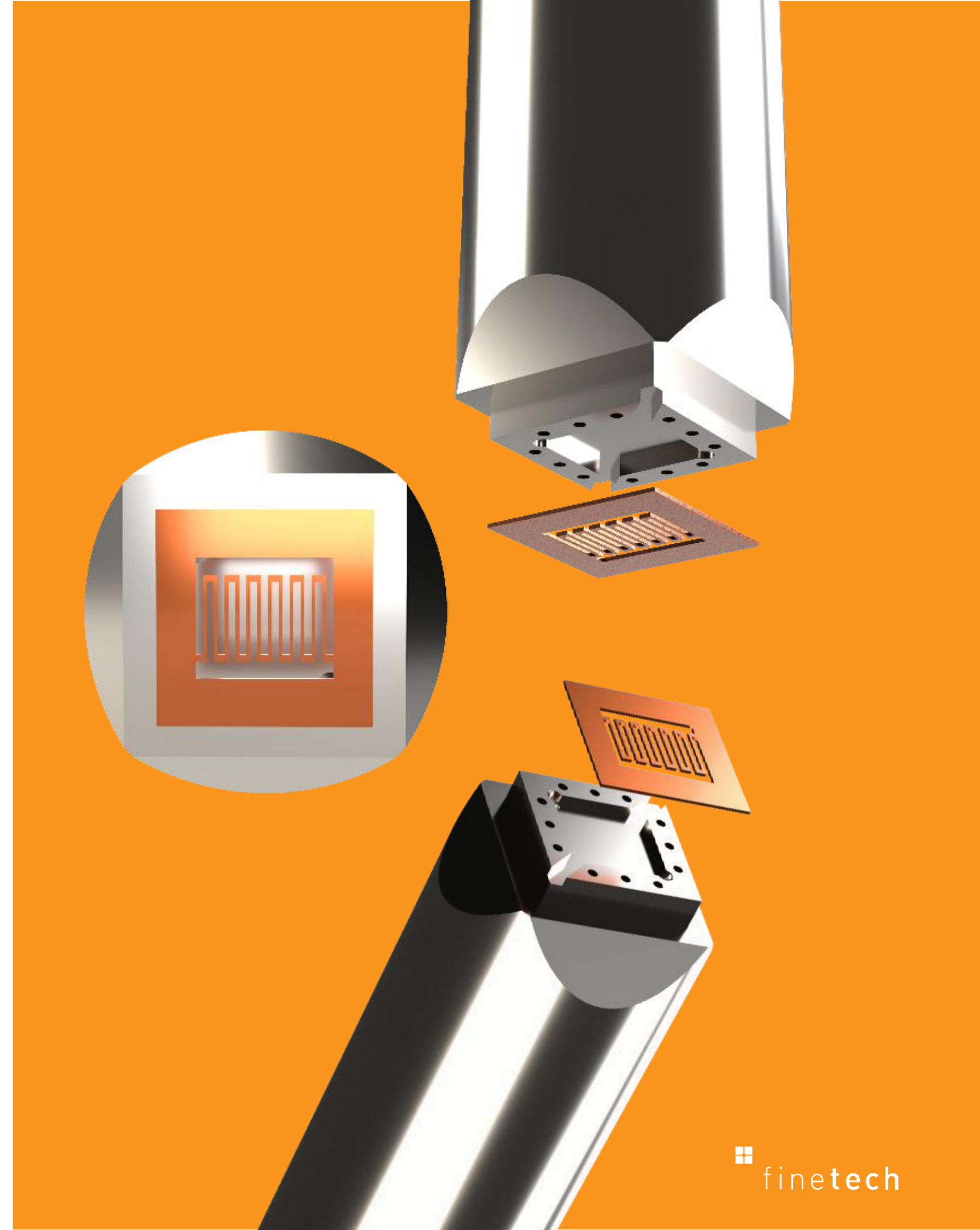
Advanced Packaging Requirements

Tooling & modularity

- Fragile, complex components need custom tooling for compliant, low-stress handling
- SiPh, MEMS, etc. architectures keep evolving, tooling must adapt across cycles without a base swap

Wide, varied component range drives tooling complexity

→ Modular base with exchangeable heads to support multiple bonding technologies



Advanced Packaging Requirements

Process parameter control

- Sub-**200 nm passive alignment** now standard
- Devices vary widely in bonding needs, so **wide parameter ranges with fine resolution**
- Curing and bond stresses set strict yield and reliability limits

→ Reliable R&D-to-production transfer needs recipe-based parameter control, traceability and yield tracking

The screenshot displays a software interface for process parameter control, organized into several sections with expandable headers:

- General**: Includes a checkbox for "Save image of the aligned position".
- Process offset**: Includes a dropdown for "Mode Offset Placement accuracy in vision" set to "Off".
- Swivel**: Includes a numeric input for "Safety gap" (0,5 mm) and a dropdown for "Touchdown drive" (Z (Motorized table)).
- Touchdown**: Includes a dropdown for "Mode" (Touch), a dropdown for "Touchdown height" (as taught (default)), a checkbox for "Include W offset in the calculation of the touchdown height", a numeric input for "Speed" (0,5 mm/s), a numeric input for "Force" (1 N), and checkboxes for "Use force control", "Man. alignment in the lower arm position", and "Interrupt touchdown movement".
- Lift-off**: Includes a numeric input for "Safety gap before pivot arm up" (0,5 mm) and a numeric input for "Lift-off speed" (0,5 mm/s).
- PR Head**: Includes a dropdown for "Alignment relative to" (Component) and a note "(no PR)".

The interface features a navigation bar at the top with buttons for "Home", "Process", "Menu", "Create/sort process steps", and "Properties of Mount (1)". The "Touchdown" section is currently selected, indicated by an orange highlight on the left sidebar.

High-accuracy Die Bonders for every stage of your die packaging journey

Manual systems



- Ideal for early R&D and feasibility work
- Compact, easy-to-use design
- Fast setup for quick experiments

Semi-automated systems



- Built for prototyping and low-volume runs
- Improved alignment, repeatability, and user support
- Bridges lab to pilot production

Fully automated systems



- For pilot lines and small-to-mid production
- Advanced pattern recognition, long-term process stability
- Continuous workflow, minimal operator input

NEW

Production systems



- Supports volume manufacturing across demanding applications
- Switches seamlessly between bonding methods and packaging styles
- Supports 12" wafers and mixed device types.

Let's build this together

- Almost 35 years of experience in high-accuracy die bonding
- One unified die bonding platform, from R&D to volume.
- All bonding technologies in one system
- Next step: bringing frontend automation and yield into backend packaging.

The hard part – already solved!



Questions?

Visit me at booth **1418**
Let's connect on LinkedIn

