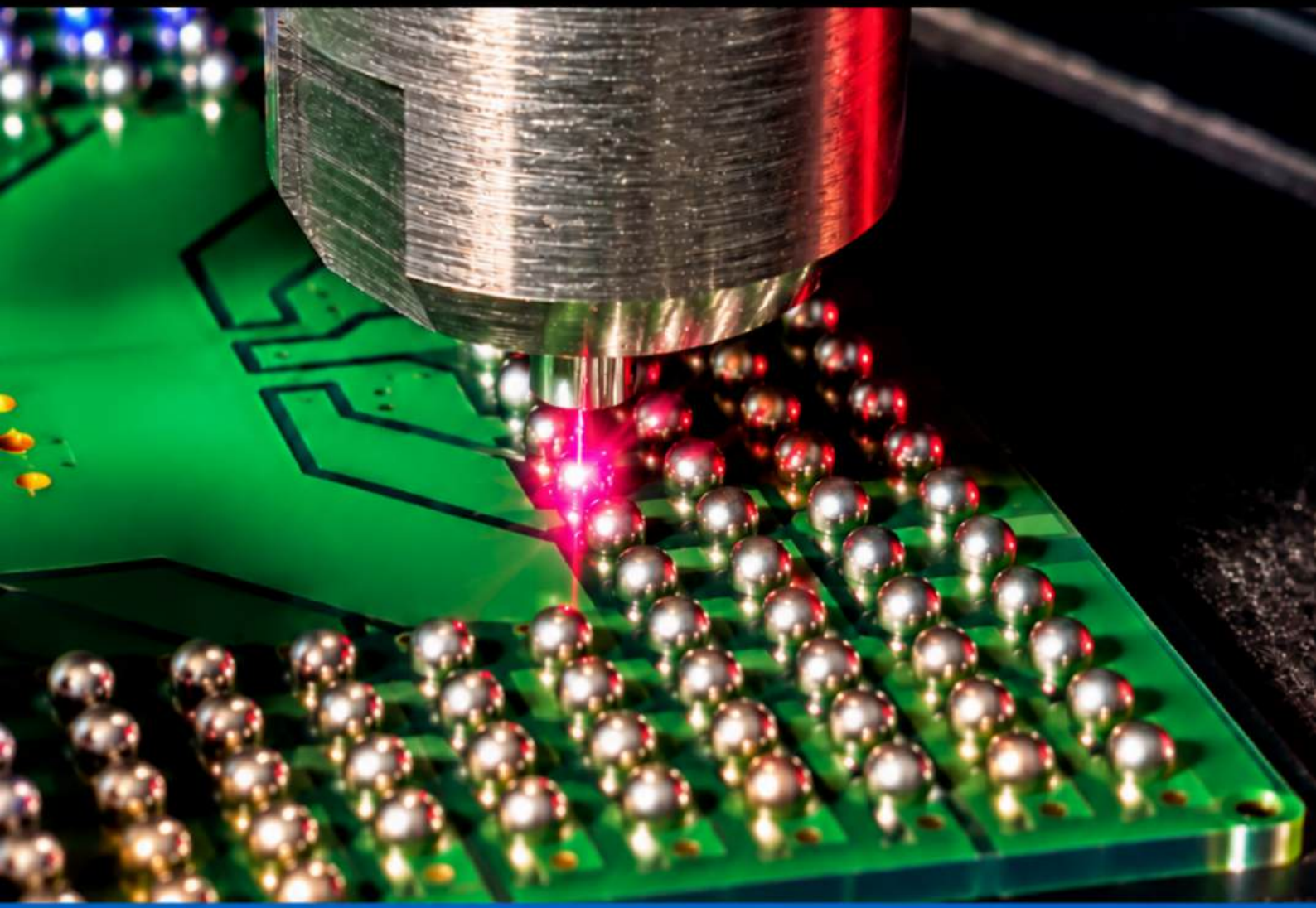
ART-TRONIX.COM

ARRAY REBALLING TECHNOLOGY

Advanced Packaging Equipment
Solder Jetting & Laser Bonding



PRECISION SOLDERING FOR ADVANCED ELECTRONICS

Clean • Precise • Flexible • Non-contact

ARRAY REBALLING TECHNOLOGY
www.art-tronix.com

Eersel • The Netherlands

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ARRAY REBALLING TECHNOLOGY

LASER SOLDER JETTING

Standard Application

Clean, precise and flexible non-contact soldering



Designed for high-precision, high-density soldering of micro-components, this laser solder jetting system handles solder balls from 40 to 760 micrometres in a wide range of alloys, including lead-free, high-lead and gold-tin materials. A focused laser pulse melts each ball and jets it to the target under nitrogen, enabling accurate placement even at very fine pitch. The process requires no dedicated tooling or flux and avoids package-wide reflow, supporting clean, low-pressure processing with optional ESD features.

KEY FEATURES

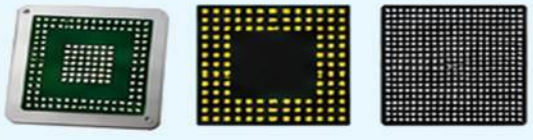
- Solder ball diameter range: 40-760 micrometres
- Compatible alloys: SnAgCu, SnAg, SnPb, AuSn and InSn
- Jetting speed up to 20 balls per second
- Heatable stage
- Automatic laser alignment
- Automatic capillary check and alignment
- Custom feeding options, including conveyor integration
- Additional options available on request

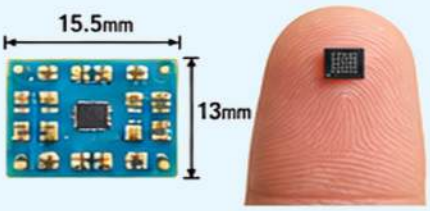
TECHNICAL HIGHLIGHTS

- No dedicated tooling required
- Flexible patterns and positioning
- Suitable for re-balling very small packages and thin PCBs
- Flux-free, contactless process
- Minimal mechanical and localized thermal stress
- No additional package-wide reflow
- No flux-residue cleaning
- Fine-pitch applications down to approximately 80-100 micrometres
- Suitable for interposers, ball stacking and leadless packages

APPLICATION EXAMPLES



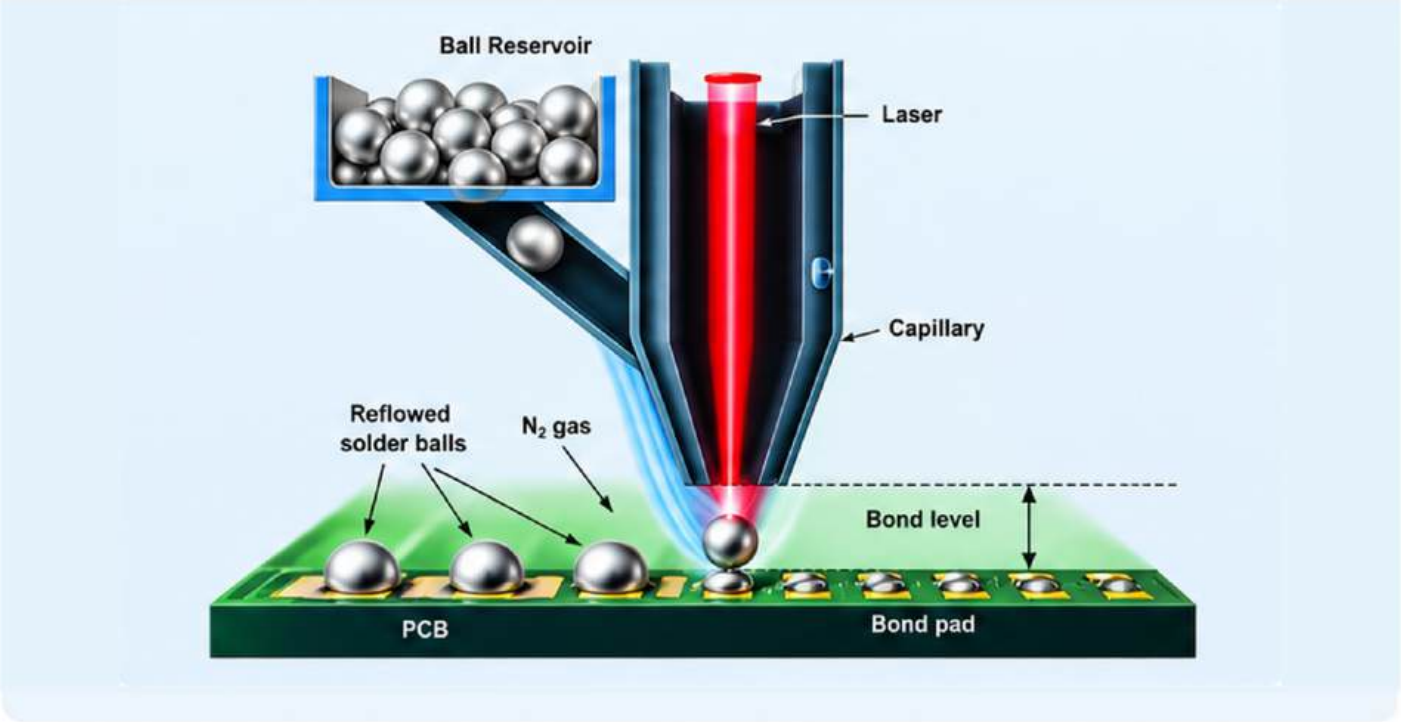




LASER SOLDER JETTING

Clean, precise and flexible non-contact soldering

Laser solder jetting feeds individual solder balls into a capillary. A focused laser pulse melts one ball at a time and transfers the molten solder directly to the required position, where it reflows and forms the joint. Because the energy is applied locally, the process supports different solder alloys and melting points while keeping the soldering area clean and precisely controlled.



The short, localized laser pulse limits heat input outside the joint area and reduces thermal stress on surrounding components. Since the system dispenses and processes one solder ball at a time, no dedicated tooling is required at the soldering position, enabling flexible and fully contactless placement.

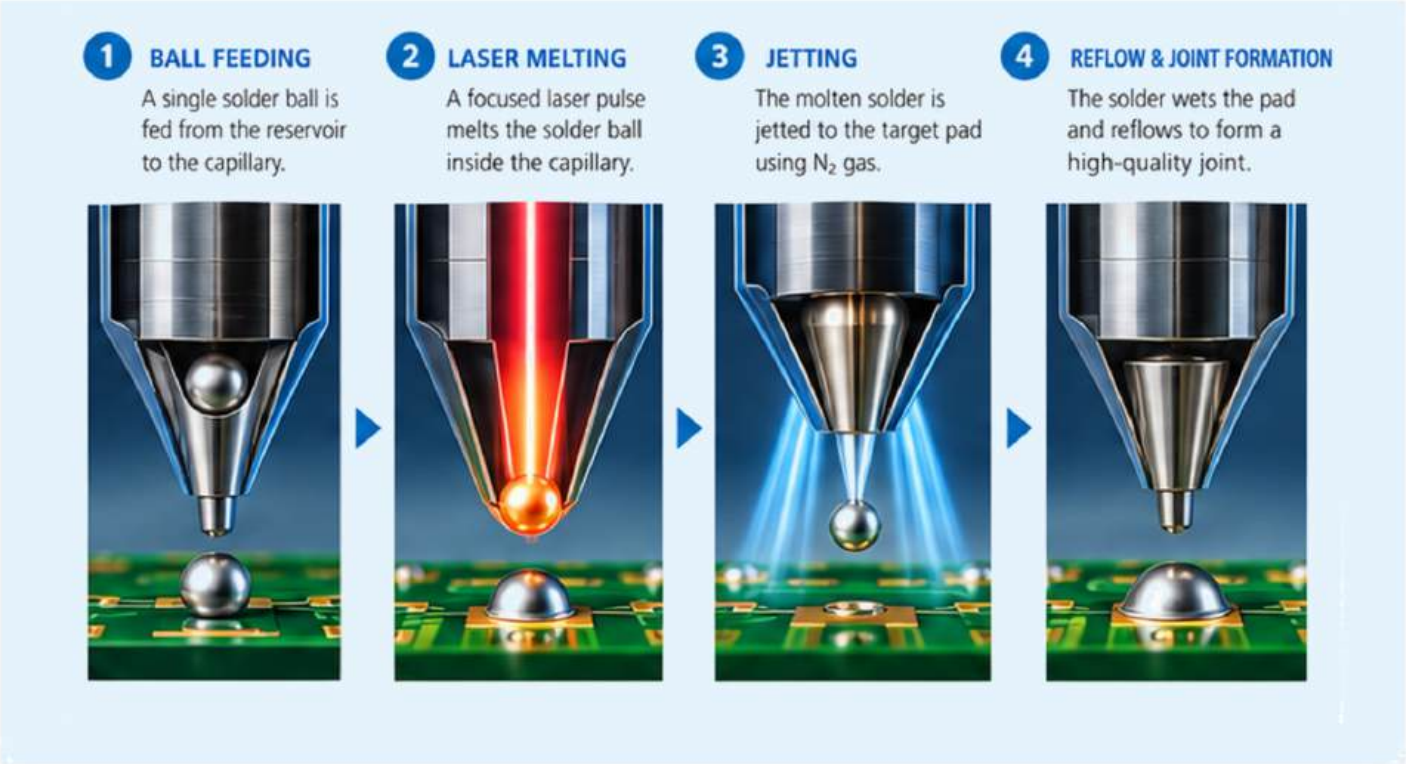
KEY ADVANTAGES

- Localized heat input
- Minimal thermal stress
- Flexible soldering positions
- Contactless process

PROCESS PRINCIPLE

Single-ball laser soldering process

A single solder ball is positioned in the capillary and heated by a focused laser pulse. Under a nitrogen atmosphere, the molten solder is transferred directly to the target and deposited on the bond pad.



1. BALL FEEDING

One solder ball is fed into the capillary and positioned for processing.

2. LASER HEATING

A focused laser pulse rapidly melts the solder ball at the capillary tip.

3. NITROGEN TRANSFER

Nitrogen supports the non-contact transfer of the molten solder toward the target.

4. BOND FORMATION

The solder is deposited on the bond pad, where it reflows and forms the connection.

SLJ-ST (Standard)

Solder Laser Jetting System



TECHNICAL SPECIFICATIONS

Dimension	L x W x H: 1100 mm x 1350 mm x 1950 mm
Weight	About 1250 kg
Solder Ball size	Φ300 μm to Φ760 μm (>760 μm by options)
Alloy	SnPb, SnAg, SnAgCu, AuSn, InSn, SnBi, etc.
Speed	Up to 20 balls/s (depending on ball size)
Jetting Accuracy	15 μm (Linear system)
Jetting type	Non-contact
Laser Options	50 W / 100 W / 200 W (by request)
Laser Auto Alignment	Optional
Inspection system	Optional
Bondstage	Stainless steel 300 mm x 300 mm platform heatable till 80 deg

SLJ-HP (High Precision)

Solder Laser Jetting System

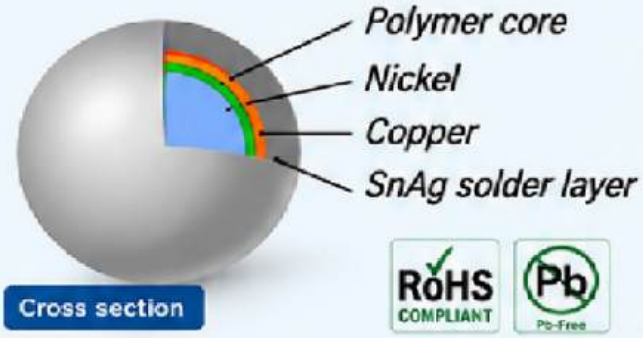


TECHNICAL SPECIFICATIONS

Dimension	L x W x H: 1100 mm x 1350 mm x 1950 mm
Weight	About 1250 kg
Solder Ball size	Φ300 µm to Φ760 µm (>760 µm by options)
Alloy	SnPb, SnAg, SnAgCu, AuSn, InSn, SnBi, etc.
Speed	Up to 20 balls/s (depending on ball size)
Jetting Accuracy	5 µm (Gantry system)
Jetting type	Non-contact
Laser Options	50 W / 100 W / 200 W (by request)
Laser Auto Alignment	Optional
Inspection system	Optional
Bondstage	Stainless steel 300 mm x 300 mm platform heatable till 80 deg

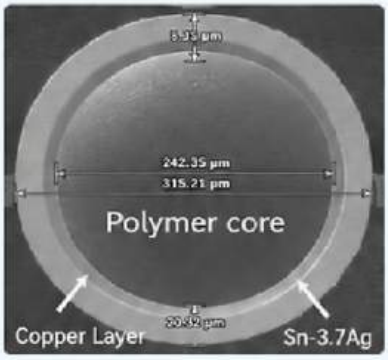
Special application : Pi-core Solder Balls

- Solder spheres with massive plastic core (polymere & elastomere)
- Solder material coating e.g. SAC_305

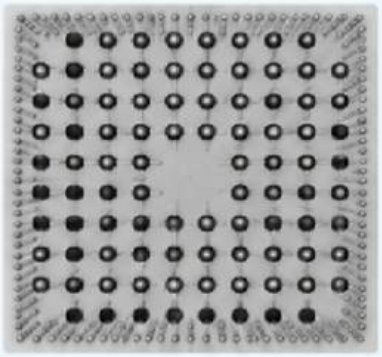


Part	Size or Thickness
Polymer core	~ 242 – 315 µm
Nickel layer	~ 3 – 5 µm
Copper layer	~ 5 – 10 µm
Solder (e.g. SAC_305)	≥ 5 µm (SB² mode)

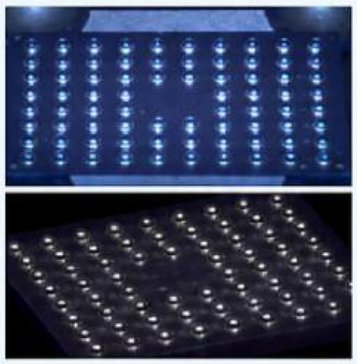
Examples



Cross section (SEM)



Solder ball array (top view)



Reflowed solder ball array

Key advantages

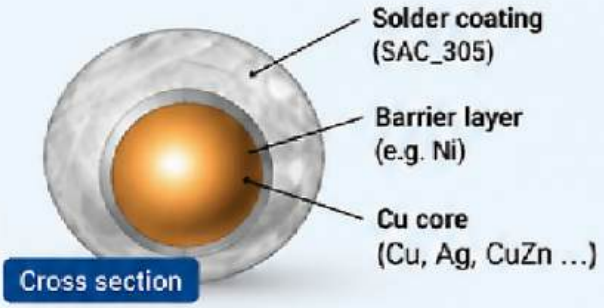
- ✓ Lightweight polymer core
- ✓ Suitable for SB² standard mode only
- ✓ Minimum 5 µm solder coating
- ✓ RoHS compliant and Pb-free
- ✓ Suitable for fine pitch applications

Typical applications

- ✓ Lightweight interconnects
- ✓ MEMS and advanced packaging
- ✓ High I/O count devices
- ✓ Cost-effective solutions
- ✓ Research and development

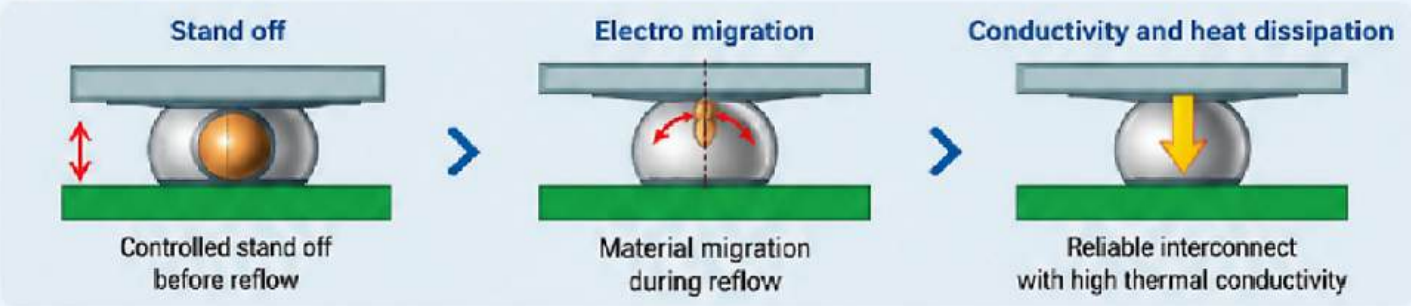
Special application : Cu-core Solder Balls

- Solder spheres with massive metal core like Cu, Ag, CuZn etc.
- Solder material coating e.g. SAC_305



Part	Size or Thickness
Cu core	30 ~ 600 µm
Barrier (e.g. Ni)	2 µm - t
Solder (e.g. SAC_305)	5 µm - 50 µm - t

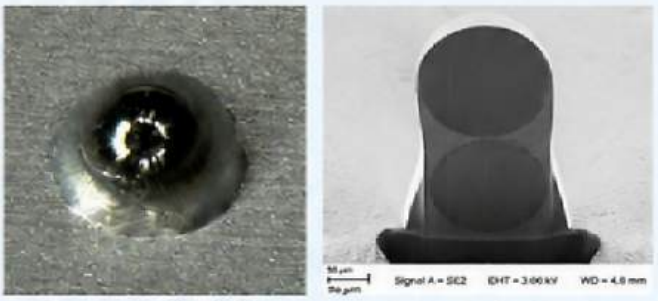
Reflow process



Application example



Close-up view



Cu-core solder ball

Cross section (SEM)

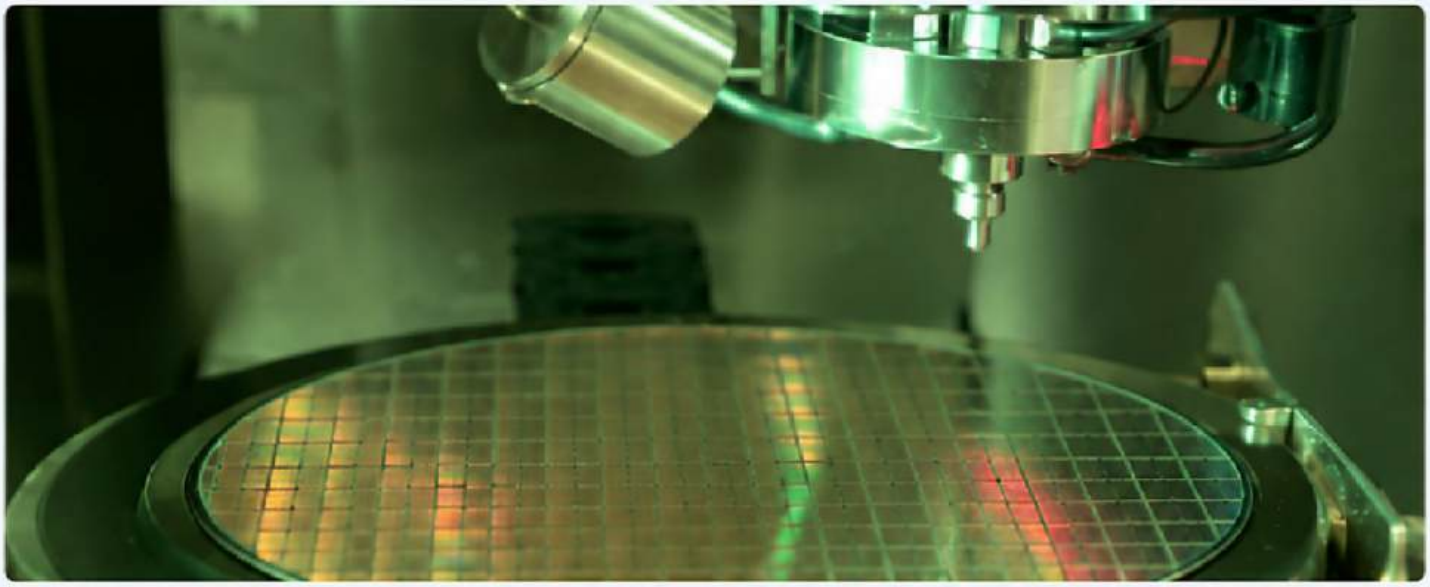
Key advantages

- High thermal conductivity due to metal core
- Suitable for fine pitch and high performance applications
- Available with different core materials (Cu, Ag, CuZn, ...)

Typical applications

- High power LED
- Advanced IC packaging
- Automotive electronics
- Thermal management solutions

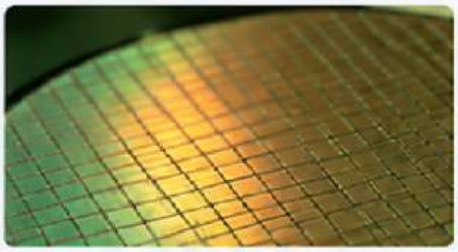
WAFER REBALLING/BUMPING SERVICES



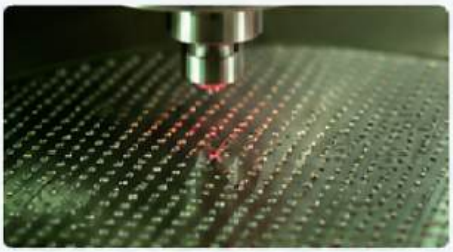
Solder ball bumping

High precision solder ball/bump placement on wafer level for advanced packaging and high I/O applications.

- High accuracy and uniformity
- Suitable for fine pitch applications
- Wide range of solder ball materials
- Custom wafer sizes supported
- Prototyping and volume production



Wafer before reballing



Solder ball/bump attach process



Wafer after reballing

Our wafer services

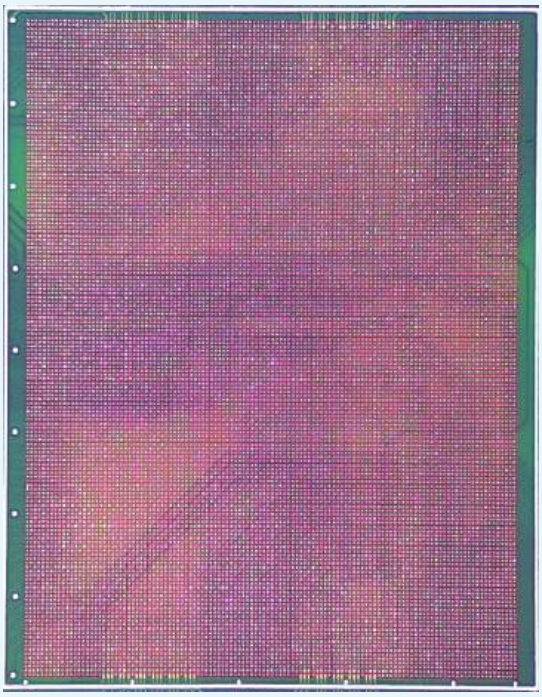
- Solder ball bumping
- Various solder ball materials (e.g. SAC, SnAg, Cu-core, Pi-core, ...)
- Process development and optimization
- Small and large wafer sizes
- R&D and low-volume production
- Quality inspection and process control
- Custom solutions on request

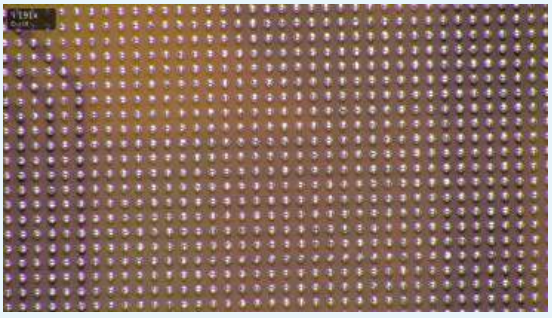
HIGH-DENSITY REBALLING SERVICES

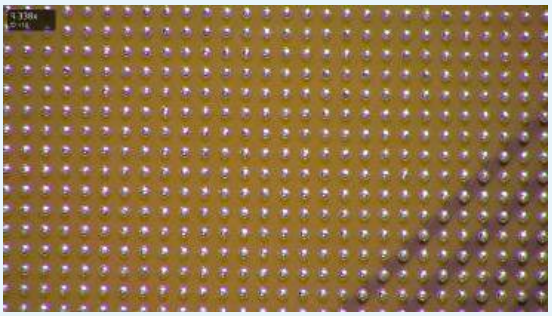
Fine-pitch solder bump applications

SAC-305 BUMPS | 80 µm | 19,200 I/O

Example of a high-density solder bump array with 19,200 interconnects.
Fine-pitch processing demands precise placement and consistent bump geometry.







HIGH I/O COUNT

19,200 solder bump connections

FINE-PITCH PROCESSING

80 µm SAC-305 bumps

APPLICATION FOCUS

- High-density area-array components
- Fine-pitch bump placement and reballing
- Microscopic inspection of solder bump arrays
- Advanced electronics and packaging applications

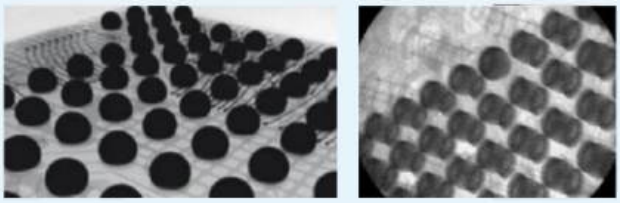
X-RAY INSPECTION SERVICES

Non-destructive analysis for electronic assemblies

INSPECTION CAPABILITIES

X-ray methods provide insight into internal structures and solder connections.

2D X-RAY ANALYSIS



LAMINOGRAPHY INSPECTION



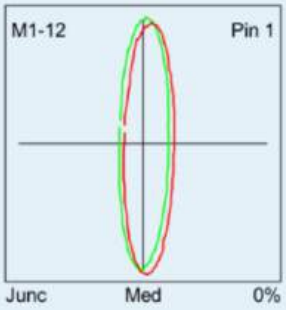
CT | COMPUTED TOMOGRAPHY



Three-dimensional investigation

- Internal features and connections
- Layer-by-layer structural views
- Non-destructive inspection
- Support for failure analysis

ELECTRICAL CURVE TRACE TESTING SERVICES



Curve trace testing

Curve trace testing is used to measure electronic components. In this process, one "golden" sample component is measured and saved. All other components of the same type will afterwards be compared to this "golden sample" to ensure proper operation.

ART-TRONIX

ARRAY REBALLING TECHNOLOGY

DON'T HESITATE TO CONTACT US!

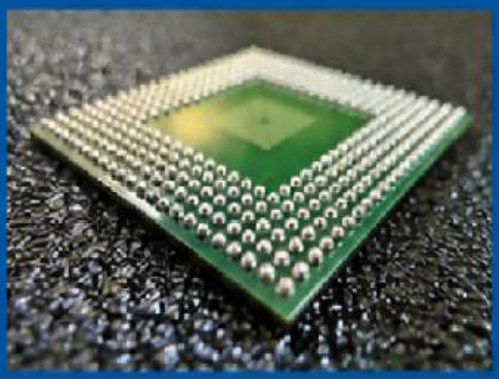
Dear Customer/Partner,

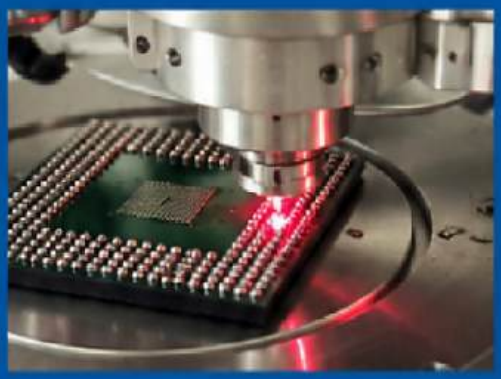
Our company provides specialized services and advanced systems for exclusive LASER reballing and bumping of a wide range of components—including BGA, µBGA, QFN, LGA, interposers, wafers, and flip-chips. We are experts in all area-array and leadless package technologies.

To give you a clear overview of our capabilities, we would be pleased to welcome you at our facility in Eersel (near Eindhoven, The Netherlands). During this visit, we can walk you through our services and systems in detail and discuss how we can best support your business.

We look forward to meeting you and building a successful partnership together.







OUR SERVICES:

- Laser Reballing & Wafer Bumping
- X-ray Laminography & CT scans
- Automatic Deballing & Alloy conversion
- Electrical Curve trace testing

VISIT OUR WEBSITE
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