

INTREPID

Intrepid Atlas Direct Bonder

Direct Wafer Bonding:

A technique that “bonds” wafers together using plasma activation to create a hydrogen “bridge” between the two wafers. This pre-bonding step takes place at room temperature under a controlled environment. During a subsequent annealing step the low-energy hydrogen bridge bonds turn into covalent bonds.

Direct bonding is the key enabling technology for the SOI wafer fabrication process and for wafer-level 3D integration.

The Atlas Automated Direct Bonder performs all essential steps: cleaning, plasma activation, alignment, pre-bonding, and IR-inspection (optional). Thus, the Atlas Direct Bonder assures a high-yield, high-throughput (26 wph) processing of wafers up to 300 mm in size.

Features:

- Intrepid's low temp plasma activation
- Production system with a high-throughput, vacuum transport (estimated throughput of \geq 26 wafer pair per hour)
- Automated cassette-to-cassette operation (load cassette platforms, SMIF or FOUP loaders)
- Contamination-free vacuum handling
- Super critical and/or chemical cleaning (optional)
- Pre-bonding with mechanical flat or notch alignment

Plasma Chamber

Proprietary Plasma Activation Module

- Proprietary plasma activation source/process
- Fully programable process, which includes control of all plasma variables ...
Mass Flow Controller (4), Automated pressure control, RF power control, etc.
- Vacuum system: 9×10^{-2} mbar (standard) and 9×10^{-3} mbar (option with turbo pump)
- Proprietary high energy RF source.

Pre-bond Station

Pre-bond Station

- Pre-bond is performed in Intrepid's unique vacuum pre-bond chamber
- Full environmental control: contact time, Force (up to 5 N) and gas type. Bond with full recipe control.
- Spacer free bonding (eliminates micro-voids and reduces particles)
- Advanced wafer flipping (performed in vacuum) eliminates chamber purge cycle contamination

Mechanical Alignment Station

In Vacuum Alignment Station

- Alignment type: flat-to-flat or notch-to-notch
- Alignment accuracy: X and Y: $\pm 5 \mu\text{m}$, Theta: $\pm 0.1^\circ$
- 100 - 300 mm wafer sizes

Clean Station (Optional)

Clean Station

- 3 standard processes: Super critical CO₂, CO₂ (Snow), or dilute RCA clean with hot N₂ dry
- Single wafer processing with full recipe control
- Centering pin load system to assure alignment to eliminate unwanted vibration

IR Station (Optional)

IR Station : For superior void detection

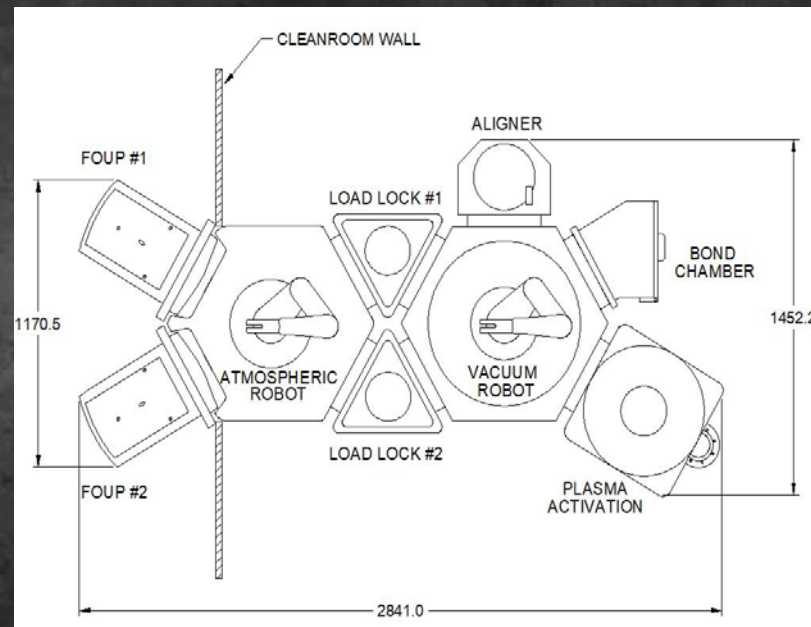
- 2 options available: ATM module (EFEM) or integrated with alignment module in vacuum
- LED illuminated with near IR LED array
- High sensitivity near IR camera for superior void detection

System Footprint: Intrepid vs EVG850LT

Small Cleanroom Footprint



ATLAS BONDER

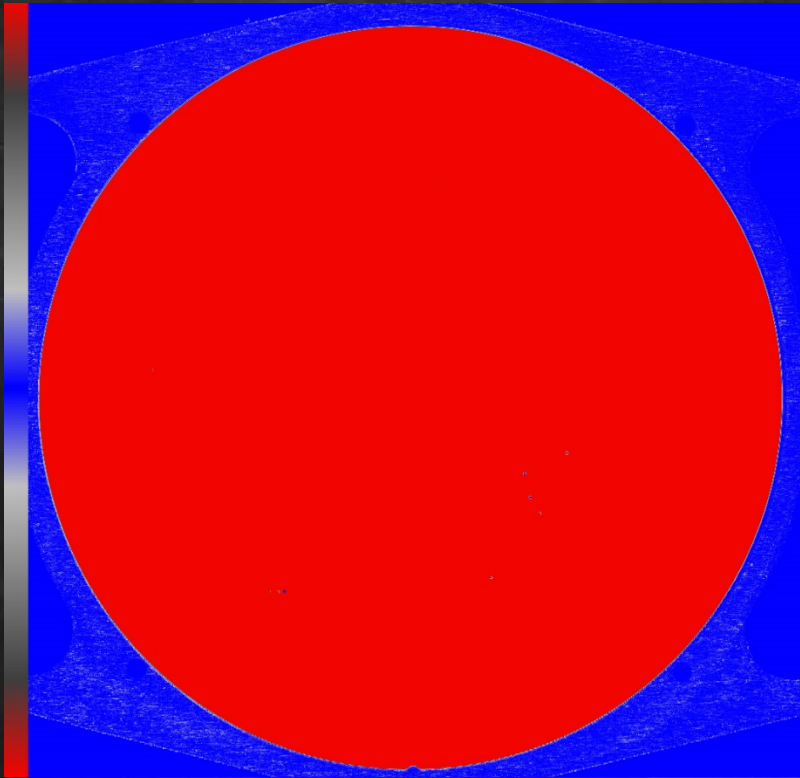


ATLAS LAYOUT

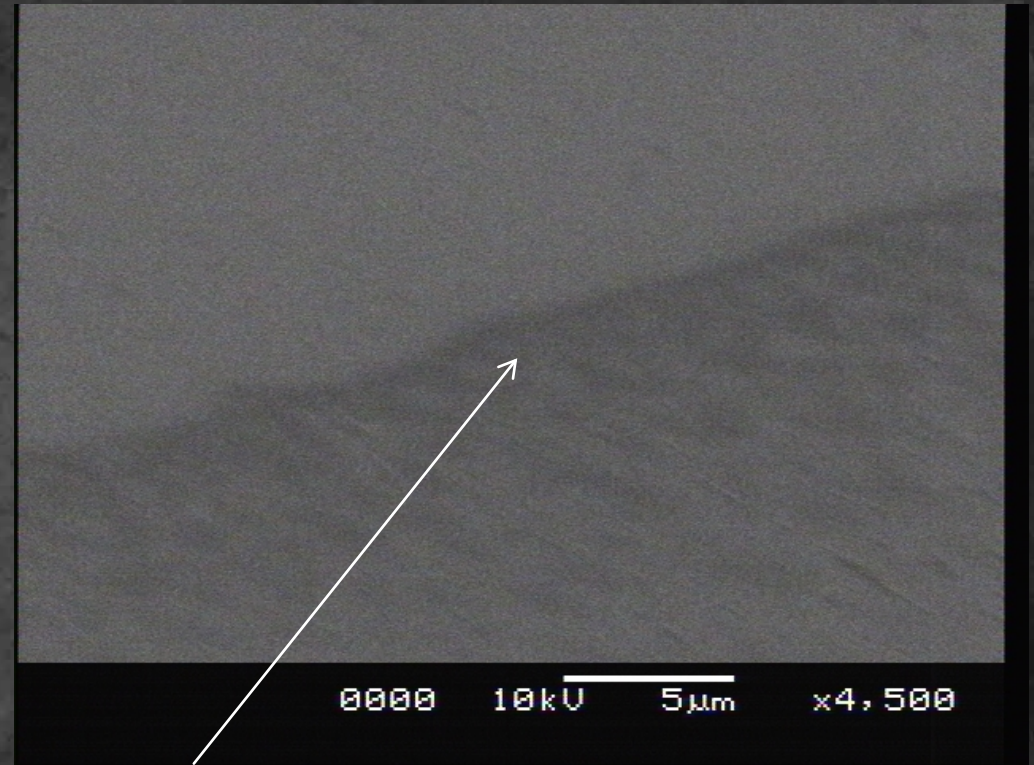


EVG850LT

Product Example



Scanning Acoustic Microscopy



Shear line showing removed material

Contact Us

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