

FC 300

High Force Device Bonder

The FC300 is a newest generation of high accuracy and high force device bonder for wafers up to 300 mm.

The tool features automated handling of chips and substrates up to 100 mm from wafer packs, plus a robotic option enabling chip picking from diced wafer and automated handling of larger substrates.

With a quick process head reconfiguration, the FC300 platform performs multiple applications including:

- High Force, particularly interesting for Cu-Cu bonding as used in 3D-IC packaging, or Nanoimprinting using a Hot Embossing Lithography process.
- Low Force Reflow Bonding for imaging devices, RF, or Optoelectronics assembly.
- UV-Curing for a Adhesive Bonding or for Nanoimprinting using a UV-NIL process.



Features & Benefits

- Bonding Accuracy $\pm 0.5\mu\text{m}$, 3σ (process dependent) and $20\ \mu\text{rad}$ planarity to guarantee highest quality for the most demanding applications
- Bonding of devices up to $100\times 100\text{mm}$ onto wafers up to 300mm to enable large format assemblies
- Optional integrated chamber for gang reflow in a gas or vacuum environment
- Optional Gas Confinement Chamber with inert or reducing gas for in-situ removal of oxides during bonding
- NIL configuration as add-on to Bonding capability for maximum flexibility

Bonding Processes

- Die Bonding (Face Up)
- Flip Chip Bonding (Face-to-Face)
- Mass Reflow, In-situ Reflow and Fluxless Eutectic Bonding
- Thermo Compression, Ultrasonic Bonding
- UV or Thermal Cured Adhesive
- UV-NIL, Hot Embossing Lithography

Applications

- Chip-to-Chip, Chip-to-Wafer bonding
- 3D Interconnect, Chip Stacking, Heterogeneous Integration
- Optoelectronic and Photonic Device Assembly
- MOEMS, MEMS, MCM...
- Nanoimprinting Applications (optics, microfluidics, etc.)

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Technical Specifications

Process station

Component Size

Chip (Upper Component) 0.2 ~ 100 mm
Thickness up to 6.3 mm

Substrate (Lower Component) Wafer up to Ø300 mm
or substrates up to 200 x 200 mm
Thickness up to 5 mm

Bonding Arm: Universal Bonding Arm

Post-bonding Accuracy ± 0.5 µm @ 3 sigma*

Leveling Travel ± 1 degree
Resolution 4.2 µrad

Z Travel 180mm
Resolution 0.03 µm

Force 5 N to 4,000 N*

Alignment Stage

XY stage Travel 410 x 395 mm
Resolution 0.01 µm

Theta Travel ± 5 degrees
Resolution 0.4 µradian

Bonding Heads

Heating sq. 22, 50, 100 mm
RT to 450°C, Resolution 1°C

Ultrasonic UV 55 - 65 kHz, 40 W max

UV 120 mW/cm² @ 365 nm

Substrate Heating Chucks

Substrate dimensions sq. 22, 50, 150, 200 mm
Diameter 300 mm

Temperature range RT to 450°C, Resolution 1°C

Optics

XY Inspection Travel 100 x 80 mm
Resolution 0.01 µm

Autocollimator Sensitivity 20 µradian on mirror

Digital Camera Resolution 0.55 µm per pixel
Illumination Dark Field and Bright Field by LED

Field of View 890 x 680 µm

Pattern Recognition System Cognex™

Options

Advanced Laser Leveling System

Face Up Station

Fluid Dispenser

Collective Reflow Chamber with Vacuum or Formic Acid capabilities (150 mm wafer)

Nanoimprint Lithography capabilities by Hot Embossing or UV-NIL:

- Imprinting Resolution Sub-50 nm
- Overlay Accuracy 250 nm

General Characteristics

Machine Footprint 1960 mm x 2100 mm

Machine Height 2163 mm

Machine Total Weight 3000 kg

Electrical Power Supply 200 V/400 V - 12.5 kVA
50/60 Hz - 3 phases

*Process or Configuration Dependent.

Data, design and specifications depend on individual process conditions and can vary according to equipment configurations. Not all specifications may be valid simultaneously. Illustrations, photos and specifications in this datasheet are not legally binding. Specifications are subject to change without prior notice.



Wafer Pick Up

Confinement Chamber

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