

# FC 150

Automated Device Bonder

The FC150 offers the latest evolution in assembly techniques. Available as an automated system to level, align and bond components, from 0.2 to 100 mm, the FC150 supports a wide range of assembly applications, including optoelectronics & MCMs.

With manual to fully automated configurations, the FC150 provides development and production capabilities on a single upgradeable cost-effective platform.

For each packaging challenge, SET works in collaboration with the end user to implement the optimum solution. The versatile design of the FC150 makes it ideal for developing a broad range of applications through innovative technologies.



## Features & Benefits

- $\pm 1 \mu\text{m}$  @ 3 sigma post-bonding accuracy and 20  $\mu\text{radian}$  leveling guarantee high yields on the most advanced products
- Air bearing and granite structure ensure long-term stability and reliability
- Compression, Z-control and temperature profiling, together with process monitoring, maximize process control
- Optical automatic leveling and alignment enables hands-off operation for production applications
- Graphic interface ensures user-friendly operation

## Bonding Processes

- Die Bonding, Flip Chip Bonding
- Mass Reflow, In-situ Reflow and Fluxless Eutectic Bonding
- Thermocompression, Ultrasonic and Adhesive Bonding
- Gold, Gold/Tin, Indium, UV or Thermal Cure Adhesive, Polymers...
- Fragile Material Compatibility: InP, GaAs, MCT...

## Applications

- Chip-to-Chip, Chip-to-Substrate Bonding, 3D-IC, Chip Stacking
- Optoelectronic & Photonic Devices Assembly
- MOEMS, MEMS, MCM...
- Nanoimprint Lithography: Aligned UV-NIL and Hot Embossing on Wafer

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## Technical Specifications

### Process station

#### Component Size

Chip (Upper Component)	0.2 ~ 100 mm Thickness up to 2 mm
Substrate (Lower Component)	0.5 ~ 150 mm (option 200mm) Thickness up to 6 mm

#### Bonding Arm: Universal Bonding Arm

Placement Accuracy	± 1 µm @ 3 sigma
Post-bonding Accuracy	1 ~ 3 µm*
Leveling Travel	± 0.57 degrees Resolution 2 µrad
Z Travel	178 mm, Resolution 0.5 µm
Force	0.3 - 500 N (1000 and 2000 N optional)

#### Bonding Arm: SET Reflow Arm

Post-bonding Accuracy	± 1 µm @ 3 sigma*
Leveling Travel	± 0.5 degrees Resolution 0.05 µrad
Z Travel	162 mm, Resolution 0.5 µm
Force	0.2 - 4 N

#### Alignment Stage

XY stage Travel	300 x 250 mm Resolution 0.1 µm
Theta Travel	± 7 degrees Resolution 8.3 µrad
Z Travel	11 mm, Resolution 0.25 µm

#### Bonding Heads

Room Temperature	Up to sq. 100 mm
Heating	sq. 22, 50, 100 mm RT to 450°C, Resolution 1°C
Ultrasonic	55 - 65 kHz, 40 W max
UV	80 mW/ cm <sup>2</sup> @ 365 nm

#### Substrate Chucks

Room Temperature	Up to sq. 150 mm (option 200 mm)
Heating	sq. 22, 50, 100, 150, 200 mm RT to 450°C, Resolution 1°C

#### Optics

XY Inspection Travel	100 x 95 mm Resolution 1 µm
Autocollimator Sensitivity	20 µrad on mirror (component roughness and reflectivity dependent)
Field of View	320 x 240 µm
Pattern Recognition System	Cognex™ Resolution 0.42 µm per pixel

### Options

Advanced Laser-Leveling System  
Automatic Alignment for Hands-off Operation  
Process Recording  
Chip Solder Flux or Epoxy Coating Unit  
Gas Confining Enclosure for Mass Reflow  
Chip Flipper (configuration dependent)  
Dispensers (Time/Pressure, Positive Displacement Pump, Jet)  
Formic Acid Vapor Bonding Environment  
Nanoimprint Lithography Configuration

### General Characteristics

Machine Footprint	1500 x 980 mm
Machine Height	2170 mm
Machine Total Weight	800 kg
Electrical Power Supply	200 V/220 V - 2 kVA 50/60 Hz - 1 phase

\*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.

