AFC
high accuracy
micro assembly cell
MORE THAN PRECISION

AFC
Precision of Assembly +/- 0.5 µm

- Modular machine concept
- +/- 0.5µm placement accuracy
- Flip-chip option
- Assembly of chip and micro-optics
  - WDM, optoelectronic components, micro-lenses, micro-mechanics
- Die Sorting
- Wafer mapping
- Epoxy stamping and dispensing
- Eutectic bonding via diode-laser or heating plate
- UV-Curing option
- Dispensing option
- Active / Passive alignment
- Active bond-force control
- Postbond inspection
Laser and Eutectic Soldering

- Adjustable heating courses with high soldering temperatures (up to 400° for AuSn-solder)
- Shortest soldering time (<1s)
- Best yield and high quality by repeatability of laser soldering

Technical Concept

- Relative positioning
- Positioning substrate to camera coordinate system X,Y,Phi
- Positioning chip to camera coordinate system X,Y,Phi

Precision Components

- Vibration damping due granite base design
- High precision stages driven by AC motors
- Precision vision system with high resolution CCD-cameras
- High accuracy bondhead with piezo systems
- Flip-Chip-Unit
- Wafer, Wafflepack, Gel-Pak

Active/Passive alignment

- Permanent observation of the components through stationary high resolution cameras
- Controlling the position during alignment and setting process
- Die alignment to active components (e.g. microlenses to energized laserchip)
- Die alignment to fiducial marks (e.g. V-groove)
- Flipped Die alignment through up- and down-side correlation
## Technical Informations

### General
- **Control**: multi-axis-controller
- **Operating System**: Windows XP
- **Operator Interface**: menu driven, English
- **Data Transfer**: ethernet TCP/IP, electronic connection: 10 Base T, 10 Mbit/s

### Equipment

#### BONDHEAD TRANSFER SYSTEM
- **Function**: moves bondhead from source side (chip side) to destination side (substrate side)
- **Coarse X axis Positioning**: linear motor driven, high velocity and acceleration, noncontact linear encoder, resolution 5µm
- **Z axis**: AC servo drive, noncontact linear encoder, resolution 1µm

#### DESTINATION TABLE FOR SUBSTRATE
- **XY axis**: AC or stepper motor driven, open-frame design (optional linear motor)
  - **Range of XY axis**: 210 x 210 mm
- **Optional: Rotations Axis**: stepper motor-driven, 360°, resolution 0.001°

#### SOURCE TABLE FOR WAFEER
- **XY axis**: AC or stepper motor driven, open-frame design (optional linear motor)
  - **Range of XY axis**: 210 x 210 mm
- **Optional: Rotations Axis**: stepper motor-driven, 360°, resolution 0.001°

#### CAMERA AXIS
- **Z axis (focussing)**: AC servo drive, resolution 1 µm

#### BONDHEAD
- **Function**: design for active adjustment; high accuracy positioning; bondforce controlling
  - **XY axis**: piezo driven; resolution 0.1µm; range: 60 x 60 µm
  - **Rotation axis**: 360°, resolution 0.001°
- **Bond Force**: programmable, standard working area 3 -100 g; resolution 0.5 g (other working area available)
- **Touch Sensor**: determines first mechanical contact between chip and substrate

#### EJECTION SYSTEMS
- **Needle Systems**: single or multi-needle system according to component size
- **Ejection Needle Type**: 0.7 mm shaft diameter, 17.0 mm long; radius 25µm, other needles on request
- **Ejection Height**: programmable height and delays
- **Ejection Speed**: programmable

### Lasersystem
- **Function**: for fast eutectic bonding with controlled heat
  - **Technique**: fiber-coupled high power laser with focussing optic
  - **Max. Output Power**: 45 W or 75 W
  - **Center Wavelength**: 808 nm (+/-10%) other wavelength on request
  - **Temperature**: programmable, range: up to 400 °C; online measurement pyrometer
  - **Pulsetime**: programmable, range: 0.01s to 9.99s; resolution: 10ms

### Image Recognition
- **Vision System**: COGNEX
  - **Focussing**: programmable; optional autofocus function during programming
  - **Recognition Methods**: standard vision tools, special filter for microstructures
  - **Pattern Recognition**: programmable windows and models

---

Amicra follows a policy of continuous product improvement. Specifications are subject to change without notice.