NOVA PLUS
accuracy meets speed
• Modular machine concept
• Multi-chip capability
• +/- 3 µm placement accuracy
• Multi-flip-chip option
• Assembly of chip and micro-components
• 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
- Up to 350° C Substrate heating (option)
- Hot pick up tool (up to 300° C)

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
- Multi-flip-Chip-Unit
- Up to 12” Wafer, Wafflepack, Gel-Pak
- Tool changing unit
- Working area 600 x 600 mm

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
- programming interface: menu driven, English
- data transfer: ethernet TCP/IP, electronic connection: 10 Base T, 10 Mbit/s

Equipment
- multi-axis-controller
- keyboard and graphic display
- menu driven, English
- ethernet TCP/IP, electronic connection: 10 Base T, 10 Mbit/s

Bondhead Transfer System
- function: moves bondhead from source side (chip side) to destination side (substrate side)
- y axis positioning: linear motor driven, high velocity and acceleration, noncontact linear encoder, resolution 5nm
- z axis: linear motor drive, noncontact linear encoder, resolution 5nm

Destination Table for Substrate
- XY axis: AC servo drive, resolution 0.1 µm
- range of XY axis: 200 x 300 mm
- substrate size: up to 600 x 600 mm

Camera Axis
- Z axis (focussing): AC servo drive, resolution 1 µm

Bond Head
- function: design for active adjustment; high accuracy positioning; bondforce controlling
- rotation axis: 360°, resolution 0.001°
- bond force: programmable, standard working area 10 - 7000 g; resolution 0.5 g (other working area available)
- touch sensor: determines first mechanical contact between chip and substrate

Multi 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

Pickup System
- pick up tool: up to 8 different pick up tools

Lasersystem (optional)
- 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 wavelengths 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

Source Camera (material side e.g. Laserchip)
- depth of field: +/- 0.1 mm
- CCD camera chip size: 1/2" or 1/3"
- field of view: approx. 5 x 1 mm² (other on request)
- pixel resolution: approx. 1.7 µm/Pixel at 1/2" CCD-chip
- illumination: coaxial lighting; LED

Destination Camera (substrate side)
- depth of field: +/- 10µm
- CCD camera chip size: 1/2", optional 1/3", 2/3"
- magnification: 10x; other magnification on request
- field of view /Fov/ Pixel: approx. 0.64 x 0.48 mm²
- resolution: approx. 0.8 µm/Pixel at 1/2" CCD-chip
- illumination: coaxial lighting; LED or halogen

Upward Camera for flip chip correlation
- depth of field: +/- 10µm
- CCD camera chip size: 1/2", optional 1/3", 2/3"
- magnification: 10x; other magnification on request
- field of view /Fov/ Pixel: approx. 0.64 x 0.48 mm²
- resolution: approx. 0.8 µm/Pixel at 1/2" CCD-chip
- illumination: coaxial lighting; LED or halogen

Dimensions / Power ratings
- size (WxDxH), weight: 1200 x 1800 x 1700 mm, 1800 kg
- vacuum: - 0.8 bar, Throughput: 3 m³/h
- compressed air: 5 bar dry and oilfree air
- nitrogen: 1 bar
- electrical power ratings: distribution voltage: 400 V opt. 230 V/115V
- ambient temperature: 18 to 25 °C
- relative humidity: non-condensing

Capacity Ratings
- module-specific cycle time: 3 s for 3 µm applications, 0.9 s for 10 µm applications
- machine availability: UP Time > 98%
- accuracy: < +/- 3µm/3σ within 3 seconds; < +/-10µm/3σ within 0.9 seconds

Applications
- WLPEWLB, embedded Die, TSV, MCM, Single Chip