HESSE
MECHATRONICS

# Bondjet BJ985

Large Area Heavy Wire Wedge Bonder

The Bonding Experts.

# Bondjet BJ985

## Fully Automatic Heavy Wire Wedge Bonder with a large working area

Bondjets BJ985 belongs to the new generation of ultrasonic wedge-wedge bonders developed for the fully automated processing of a wide range of large-sized substrates, chips, automotive applications (e.g. batteries) and other materials. The systems can be used as a fully automatic machine or operated manually. Hesse offers the only available solution on the market of handling wires from 50 µm up to 600 µm** with only one bondhead.

Bondjet BJ985 is characterized by several new features:

- Optimized pattern recognition (PR)
- Software features for the growing demand of connectivity and industry 4.0 (e.g. Hesse Bonder Network, remote control of PR, improved MES integration, ...)
- Hesse Assist Tools: load cell, bondtool and wire spool detection, tool calibration without wedge gauge for operator independency

Outstanding features of the new Bondjet BJ985 are the large bonding area of 370 mm x 870 mm, a high drive through and high speed.

Hesse GmbH, as technology leader, has designed the only heavy wire bondhead with a non destructive pulltest and a unique transducer integrated sensor for 100 % quality monitoring in real time. A bondhead change from aluminium to copper can be realized within minutes. In addition to a standard configuration Hesse offers automation concepts individually adapted for every application.

### Flexibility

- Working area
  - BJ985: 370 mm x 870 mm
- Flexible use of the large working area, e.g. vacuum clamping of several 5" x 7" standard DCBs
- Maximization of throughput by automation (two/more parallel lanes)

Battery Bonding

## Large Area Heavy Wire Wedge Bonder

## Your benefits in the spotlight

### Advanced features and process advantages

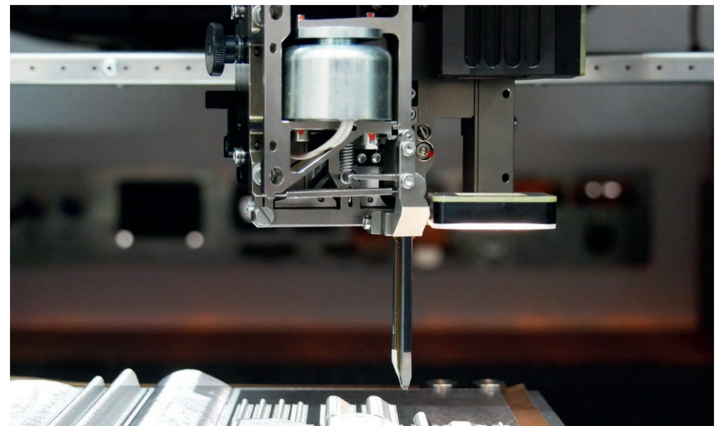
- 50 µm – 600 µm** bondhead for Al, Cu, AlCu (2 mil - 24 mil)
- Improved wire handling: short distance between bondhead and spool
- Optimized pattern recognition: image capture with new digital image processing and flash
- Hesse Assist Tools (option):
  - E-Box: patented solution for optimized tool change and programmable alignment marks for cutter, wire guide and bond wedge
  - Automated bondforce calibration; a load cell prevents operating error and ensures robust processes
  - Innovative bondtool detection
  - Wire spool detection
- Automated bondtool calibration without wedge gauge
- Precisely programmable bondforce actuator
- Loop generator for individualized loops
- Wear-free components with Piezo technology
- Maintenance-free solid state joints
- Pre-setting of bondheads via EEPROM

### Quality

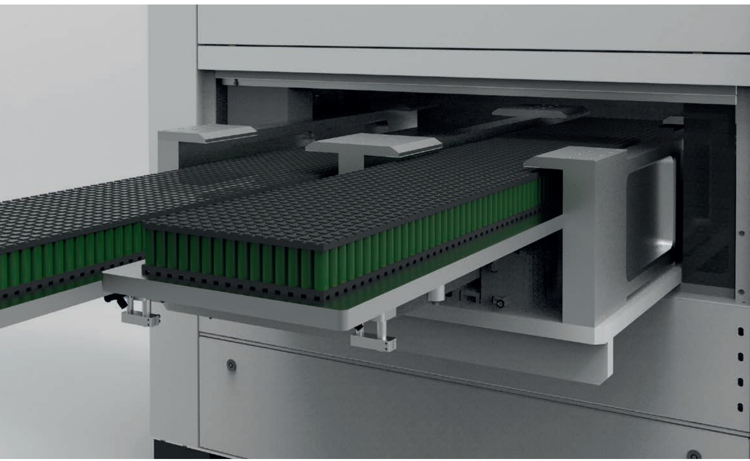
- Continuous, real time monitoring of wire deformation, transducer current and frequency within programmable control limits
- Process integrated Quality Control PiQC: detection of further parameters, e.g. friction behavior, by additional sensor system for 100 % quality monitoring in real time (patented); as option
- Remote pull function on PiQC threshold value for optimized cycle time; up to 30 % save on equipment
- Integrated, non destructive pulltest for wire and ribbon

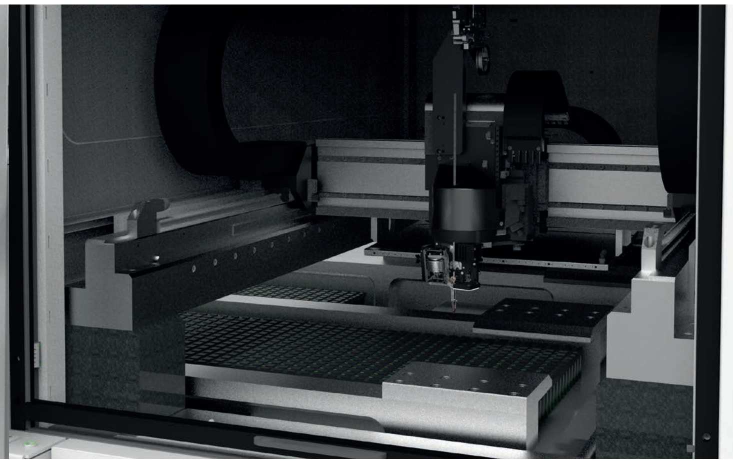
### Heavy wire bondheads

- Heavy wire and ribbon bondheads for Al, Cu and AlCu
- An intelligent bondhead connecting system with integrated memory stores all calibration data and enables bondhead replacement in a few minutes
- Wire clamp for loop shape control is standard on all bondheads; optionally equipped with non destructive pulltest



HBK Heavy Wire Bondhead





# Technical data at a glance

## Working area
- BJ985: X: 370 mm; Y: 870 mm; Z: 42 mm
- P-rotation: 440°

## Mechatronic bondhead
- HBK (Frontcut, Backcut)
- RBK Ribbon (Frontcut)
- RBK Copper (Frontcut, Backcut)

Frequency: 60 kHz*; alternative frequencies available on request

## Cutting methods
- active, passive, air cut (for frontcut)

## Wire
- Al, Cu, AlCu: 50 µm – 600 µm** (2 mil – 24 mil)

## Ribbon
- Al, Cu, AlCu: 250 µm x 25 µm up to 2000 µm x 400 µm** (Cu: 200 µm) (10 mil x 1 mil up to 80 mil x 16 mil)

## Ultrasonic
- Digital ultrasonic generator with PLL (Phase Locked Loop), internal frequency resolution <1 Hz
- Programmable ultrasonic power output

## Small footprint – high performance
- 880 mm x 1780 mm x 1912 mm (W x D x H, excl. monitor and light tower), appr. 1800 kg

## Media connectivity
- Compressed air (high purity)
- Vacuum
- 16A AC
- Digital IOs
- USB Ports
- SMEMA connection
- Gigabit Ethernet (TCP/IP)
- Profibus support

## Various loop form functions
- Reproducible loop geometry by wire guide appropriate for the material involved and moving wire buffer
- Constant wire length and loop height
- Mechanically demanding loop geometrics by parameterization and individual wire clamp application
- Individual loop shapes by configurable loop trajectory generator

## Manual and fully automated operation
- Standard components or individually adapted solutions
  - Manual bonding station (with/without heating)
  - Automated bonding station (with/without heating), multi-lane operation → lowest Cost of Ownership (CoO)
  - Indexer / transport system
  - Magazine lifts
  - Visualization
- Integrated PLC controller
- Integrated operation in machine control (TwinCAT®)

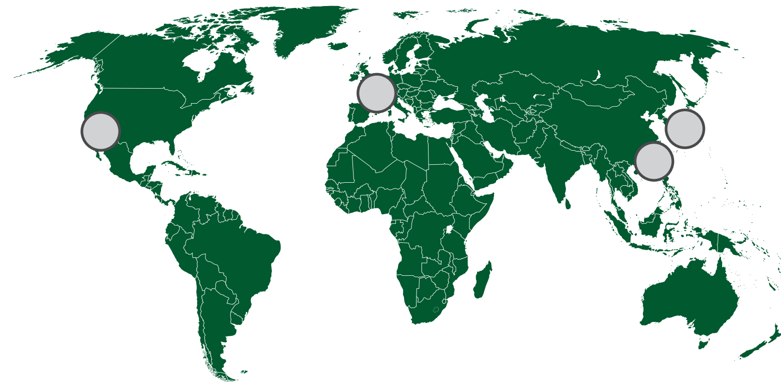
## Software Options
- Hesse Bonder Network (HBN): complete line management, synchronization of data, easy integration of new machines via Plug & Produce, no server necessary
- Offline Programming: program bond programs outside the bonder and outside the production environment; for training purposes
- PBS Server & Workbench 2.0: central data management, line management, automatic backup system, remote pattern recognition
- TwinCAT® Automation: integration of control software for automation in Hesse Bonder Interface
- SECS/GEM: integrated, standardized server connection for automation and communication, handling via Workbench
- MES: interface to Manufacturing Execution Systems, integrated or customized implementation
- CSV Logger: storage of all machine and process data, e.g. bond positions etc.
- Login via USB stick

* exact range of frequencies on request
**depending on application and wire

# HESSE MECHATRONICS

# Worldwide. Near you.

Hesse GmbH - Your partner for ultrasonic and thermosonic wire bonders for all common wire dimensions in combination with standardized or customized automation solutions.



Hesse GmbH, founded in 1995 and based in Paderborn, Germany, develops and manufactures fully automatic ultrasonic and thermosonic wire bonders together with standard or customer-specific automation solutions for the semiconductor industry backend. Hesse GmbH is one of the world's leading producers of wire bonders using the ultrasonic wedge-wedge technology and develops customer-specific production processes.

All relevant semiconductor manufacturers are among the worldwide clientel of Hesse GmbH. Distribution and service are performed from the headquarters or by subsidiaries in Hong Kong, the US and Japan and together with partners in over 30 other countries.

The core competencies of the company are mechatronic systems, ultrasonic technology, control engineering and the detailed understanding and knowledge of the processes and physical effects relevant in ultrasonic joining technology. In order to maintain and expand technological leadership, we conduct intensive research and development in all aforementioned areas.

**www.Hesse-Customersolutions.com**

We support you in developing and implementing your individual process requirements. Our range of services includes:

- Pre-production prototype
- Small series production
- (Online) Services:
  - Training
  - Production support
  - Process optimization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