Bondjet BJ955/9
Heavy Wire Wedge Bonder
Bondjet BJ955/BJ959

Fully Automatic Heavy Wire Wedge Bonder

Bondjets BJ955 and BJ959 belong to the new generation of ultrasonic wedge-wedge bonders developed for the fully automated processing of a wide range of large-sized substrates, chips 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 BJ955/959 are characterized by several new features:

- Optimized pattern recognition
- 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 are high speed and the largest bonding area. A change from aluminium to copper can be realized within minutes.

The 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. Advanced features available on the Bondjet BJ955 and BJ959 are designed to meet your present and future requirements and greatly enhance productivity. In addition to a standard configuration Hesse offers automation concepts individually adapted for every application.

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
  - Loop generator for individual loops
  - Wear-free components with Piezo-Technology
  - Maintenance-free solid state joints
  - Pre-setting of bondheads via EEPROM

Flexibility

- Working area
  - BJ955: 305 mm x 410 mm (12.0″ x 16.1″)
  - BJ959: 370 mm x 560 mm (14.6″ x 22.0″)
- 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)

Quality

- Continuous real time monitoring of wire deformation, transducer current and frequency within programmable control limits
- Process integrated Quality Control PIQQC: detection of further parameters by additional sensor system (e.g. friction) for 100% quality monitoring in real time (patented); as option
- Remote pull function on PIQQC 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
Technical data at a glance

Working area
- BJ955: X: 305 mm (12’’); Y: 410 mm (16.1’’); Z: 42 mm (1.65’’)
- BJ959: X: 370 mm (14.6’’); Y: 560 mm (22.0’’); Z: 42 mm (1.65’’)
- P-rotation: 440°

Mechatronic bondhead
- HBK (Frontcut, Backcut)
- RBK Ribbon (Frontcut)
- RBK Copper (Frontcut, Backcut)
Frequency: 60 kHz*; alternative frequencies 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
- BJ955: 740 x 1484 x 1910 mm (29.1” x 58.4” x 75.2”), appr. 1100 kg
- BJ959: 805 x 1634 x 1910 mm (31.7” x 64.3” x 75.2”), appr. 1250 kg

Media connectivity
- Compressed air (high-purity)
- Vacuum
- 16A AC
- Digital IOs
- USB-Ports
- SMEMA connection
- Gigabit-Ethernet (TCP/IP)
- Profinet 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 geometries 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), multilane 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
- 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 GmbH - Your partner for ultrasonic and thermosonic wire bonders for all common wire dimensions as well as ultrasonic flipchip bonders in combination with standardized or customized automation solutions.

Hesse GmbH, founded in 1986 and based in Paderborn, Germany, develops and manufactures fully automatic ultrasonic and thermosonic wire bonders as well as ultrasonic flipchip 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 clientele of Hesse GmbH. Distribution and service are performed from the headquarters or by subsidiaries in Hong Kong, the USA 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.

Process support, development and consulting:

- Sample-bonding
- Pre-production prototype
- Design validation builds
- Small series production
- Module production
- Process optimization

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