Bondjet BJ935/BJ939
Fully Automatic Heavy Wire Wedge Bonder

Bondjets BJ935 and BJ939 are ultrasonic wedge-wedge bonders developed for the fully automated processing of a wide range of 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.

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 BJ935 and BJ939 are designed to meet your present and future requirements and greatly enhance productivity.

Advanced features and process advantages
- 50 µm – 600 µm** bondhead for Al, Cu, AlCu (2 mil - 24 mil)
- Precisely programmable bondforce actuator
- Wear-free components with Piezo technology
- Maintenance-free solid state joints
- Cutting methods:
  - Active Cutting: repeatable, precise, programmable cutting depth
  - Air Cut: No impact on surface, e.g. for highly sensitive chips because of „touch-free“ cutting
  - Passive Cutting
  - E-Box: patented solution for optimized tool change and programmable alignment marks for cutter, wire guide and bond wedge

Flexibility
- Working area
  - BJ935: 254 mm x 244 mm
  - BJ939: 350 mm x 560 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)

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 by additional sensor system (e.g. friction) 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
- PBS200: server for central data management
- BDE, Traceability: in PBS200 integrated XML interface or customized implementation
- SECS/GEM: integrated standardized server connection for automation and communication, handling via Workbench
- MES: interface to Manufacturing Execution Systems, integrated or customized implementation

Heavy wire bondheads
- Heavy wire and ribbon bondheads for aluminum, copper 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
- BJ935: X: 254 mm; Y: 244 mm; Z: 70 mm
- BJ939: X: 350 mm; Y: 560 mm; Z: 70 mm
- 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 bis 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

Footprint and weight
- BJ935: 670 mm x 1310 mm x 1902 mm (W x D x H, excl. light tower),
  appr. 1100 kg
- BJ939: 760 mm x 1560 mm x 1902 mm (W x D x H, excl. light tower),
  appr. 1400 kg

Media connectivity
- Compressed air (high purity)
- Vacuum
- 16A/230V AC
- Digital IOs
- USB Ports
- SMEMA connection
- 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

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

Options
- E-Box: patented solution for optimized tool change and program-
  mable alignment marks for guide, cutter and bond wedge
- PIQC: Process integrated Quality Control by multi-dimensional sig-
  nal analysis - integrated in Hesse Mechatronics’ Workbench
- PBS200: server for central data management, handling via Work-
  bench
- BDE, Traceability: in PBS200 integrated XML interface or customized
  implementation
- SECS/GEM: integrated standardized server connection for automati-
  on and communication, handling via Workbench
- MES: interface to Manufacturing Execution Systems, integrated or
  customized implementation

You want more?
Contact us - we will provide a solution!

* exact range of frequencies on request
**depending on application and wire
Hesse GmbH, founded in 1986 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.

Process support, development and consulting:
We support you in developing and implementing your individual process requirements. Our range of services includes:
- Sample bonding
- Pre-production prototype
- Design validation builds
- Small series production
- Module production
- Process optimization

Hesse GmbH
Lise-Meitner-Str. 5, 33104 Paderborn, Germany
Phone: +49 5251 1560-0
Fax: +49 5251 1560-290
Web: www.hesse-mechatronics.de
E-Mail: info@hesse-mechatronics.com

Hesse Mechatronics, Inc. (America)
213 Hammond Ave, Fremont, CA 94539, USA
Phone: +1 408 436-9300
Fax: +1 484 231-3232
E-Mail: info@hesse-mechatronics.us

Hesse Asia Ltd. (China/Hong Kong)
Unit 807, 8/F Westin Centre, 26 Hung To Road, Kwun Tong, Hong Kong
Phone: +852 2357-9410
Fax: +852 2357-4700
E-Mail: sales@hesse-mechatronics.com.hk

Hesse Mechatronics Japan Co., Ltd. (Japan)
Horidome General Bldg. 1F, 1-9-6 Nihonbashi Horidomecho, Chuo-ku, Tokyo 103-0012, Japan
Phone: +81-3-6264-8686
Fax: +81-3-6264-8688
E-Mail: info-jp@hesse-mechatronics.com

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