

## Bondjet BJ653

Bonder for all Bonding Methods



# Bondjet BJ653

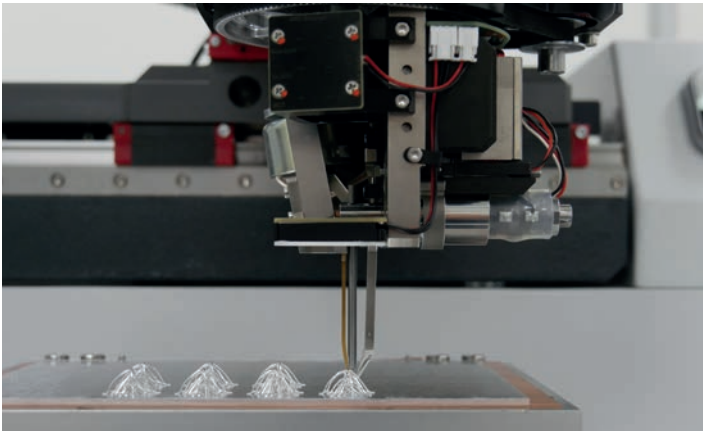
## A Bonder for manual or automatic bonding

The Bondjet BJ653, with its changeable bondheads, serves the wire bonding processes of wedge-wedge as well as ball-wedge and can handle fine wire, heavy wire and ribbon.

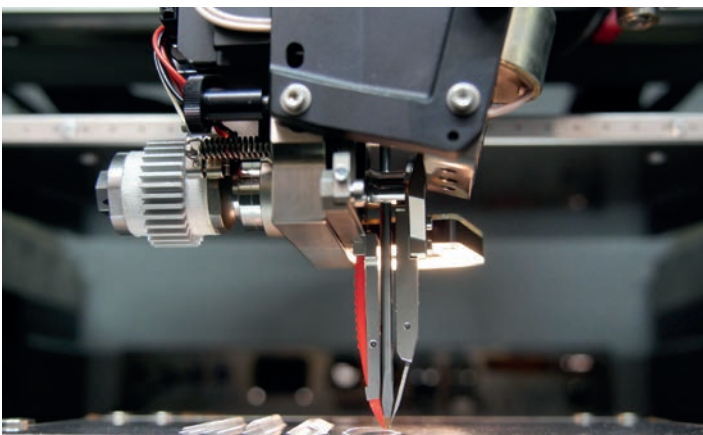
The operating methods from manual to automatic bonding is particularly appropriate for the use in laboratories, in the development and for suppliers for validating their product quality. BJ653 is ideal for product samples, pre-production prototypes or small volume production runs in proven and reliable Hesse quality.

The Bondjet BJ653 is part of the new bonder generation and offers the same handling regarding operation and look & feel as the the fully automatic machines of Hesse. It is characterized by an open workspace, which achieves the same process result as in a fully automated production wire bonder. The Bondjet BJ653 has a lower throughput than the other Bondjets but is the avenue to fully automatic wire bonding.

The available bondheads for the BJ653 are identical to the bondheads for the Hesse production machines. This enables a targeted preparation of the production process on the Bondjet BJ653.



HBK Heavy Wire Bondhead



RBK Ribbon Bondhead

## Bonder for all Bonding Methods

## Your benefits in the spotlight

### Advanced features and process advantages

- Bondheads for all common wire materials
- Wear-free components with piezo technology
- Maintenance-free flexure hinges
- Working area: X: 100 mm; Y: 90 mm ; Z: 50 mm
- Intelligent bondhead connecting system with integrated memory storing all calibration data: bondheads are interchangeable within a few minutes
- Optimized pattern recognition
- Use of all common wire spools
- Loop generator for customized loops
- Integrated, non destructive pulltest for wire and ribbon (HBK, RBK)
- Continuous, real time monitoring of wire deformation, transducer current and frequency within programmable control limits
- Machine mobility by mounted rollers; as an option

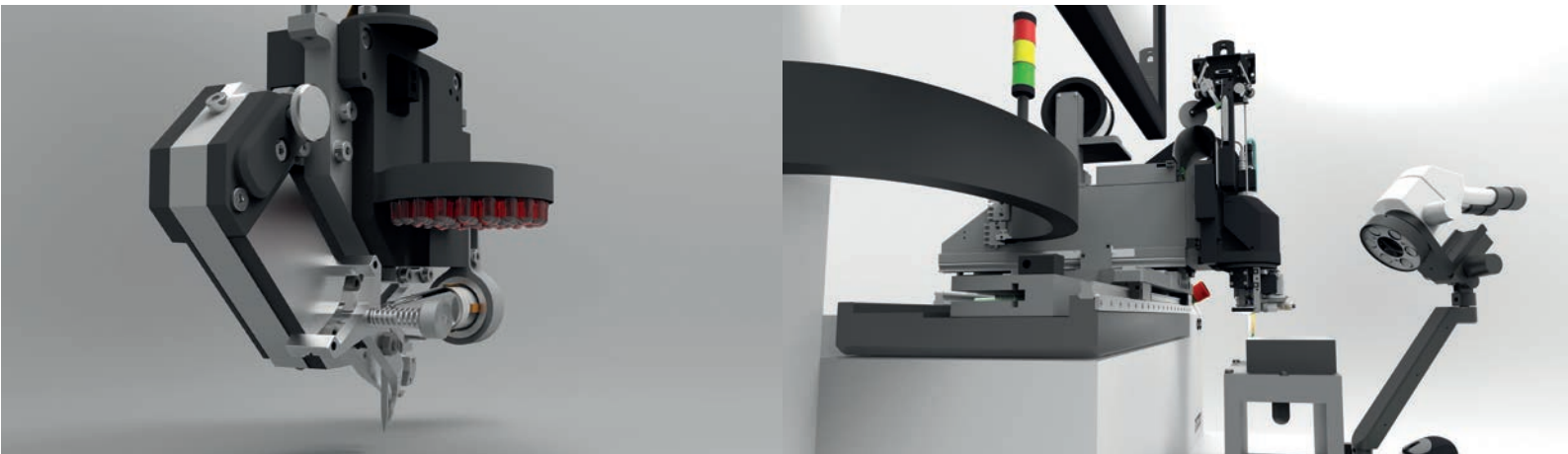
## Heavy Wire Bondheads for BJ653

### Heavy Wire Wedge-Wedge Bondheads

- Heavy wire and ribbon bondheads for aluminum, copper and AlCu:
  - HBK (Frontcut, Backcut)
  - RBK Ribbon (Frontcut)
  - RBK Copper (Frontcut, Backcut)
- Frequency: 60 kHz\*; alternative frequencies available on request
- Wire Al, Cu, AlCu: 50  $\mu\text{m}$  – 600  $\mu\text{m}$  (2 mil – 24 mil)\*\*
- Ribbon Al, Cu, AlCu: 250  $\mu\text{m}$  x 25  $\mu\text{m}$  up to 2000  $\mu\text{m}$  x 400  $\mu\text{m}$  (Cu: 200  $\mu\text{m}$ ) (10 mil x 1 mil up to 80 mil x 16 mil)\*\*
- 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
- Integrated, non destructive pulltest
- Process integrated Quality Control PiQC: detection of further parameters by additional sensor system (e.g. friction) for 100 % quality monitoring in real time (patented); available as an option

### Heavy Wire Loop Design

- Reproducible loop geometrics by wire guide appropriate for the material (e.g. pulling wire buffer)
- Loop form functions: constant wire length, constant loop height, individual loop shapes
- Mechanically demanding loop geometrics by parameterization and individual wire clamp application



## Fine Wire Bondheads for BJ653

### Fine Wire Wedge-Wedge Bondheads

- Bondhead 45° and 90° (deep access)
- Frequency: 100 kHz\*; alternative frequencies available on request
- Wire Al, Au: 12.5 µm – 75 µm (0.5 mil - 3 mil)\*\*  
Cu: 17.5 µm - 50 µm (0.7 mil - 2 mil)\*\*
- Ribbon: Al, Au: 35 µm x 6 µm up to 250 µm x 25 µm (1.4 mil x 0.25 mil up to 10 mil x 1 mil)\*\*
- High precision touchdown detection without time delay, e.g. for bonding on very thin substrates
- Precise bondforce control (static and dynamic)
- Process integrated Quality Control PiQC: detection of further parameters by additional sensor system (e.g. friction) for 100 % quality monitoring in real time (patented); available as an option

### Fine Wire Wedge-Wedge Loop Design

- Loop form functions: constant wire length, constant loop height, individual loop shapes
- Fine pitch: 40 µm in-line, 25 µm staggered/dual-line (depending on wire and loop)
- Freely programmable wire feed, tail length, tear stroke and opening gap of wire clamp

### Ball-Wedge Bondhead (in preparation)

- Thermosonic ball-wedge bondhead
- Frequency: 120 kHz\*  
Option: Dual-Frequency 120/60 kHz\*
- Wire: Au 17.5 µm – 50 µm (0.7 mil - 2 mil)\*\*

### Technical Data:

- Open working area BJ653: X: 100 mm; Y: 115 mm; Z: 42 mm
- P-rotation: 440°
- Digital ultrasonic generator with PLL (Phase Locked Loop), internal frequency resolution <1 Hz; programmable ultrasonic power output
- Windows® Embedded operating system
- Height of operator desk: 730 mm
- Footprint: 700 mm x 1020 mm x 1409 mm (W x D x H, excl. monitor and light tower)
- Weight: approx. 330 kg, depending on configuration

### Media connectivity

- Compressed air (high purity)/nitrogen
- Vacuum
- 100 -240V 50Hz/60Hz
- USB ports
- Gigabit Ethernet (TCP/IP)

### Options

- Stereo microscope with adapter arm, magnification from 6.5- to 40- times in 5 steps, incl. lighting
- Camera microscope (in preparation)
- E-Box Lite: Inspection camera (in preparation)

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

\* exact range of frequencies on request

\*\*depending on application and wire

# HESSE

## MECHATRONICS

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 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.

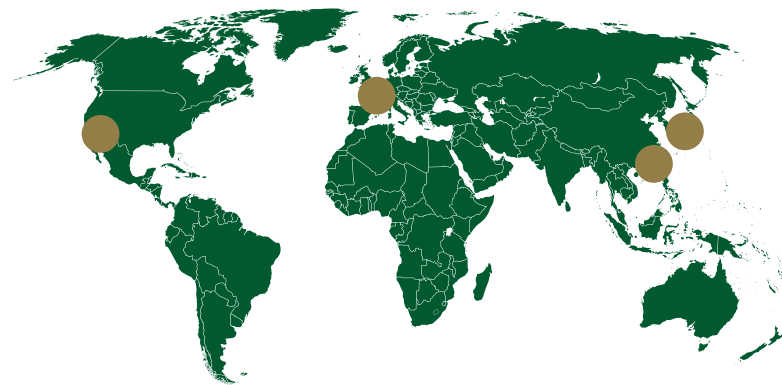
The core competencies of the company are mechatronic systems, ultrasonic technology, control engineering and the detailed understanding and knowledge of the processes and physical effects relevant in ultrasonic joining technology. In order to maintain and expand technological leadership, we conduct intensive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

## Worldwide. Near you.



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The Bonding Experts.