

## Smart Welder SW985

Best of both Technologies:  
ultrasonic welding & wire bonding



# Smart Welder SW985

Fully Accessible Working Area of 370 mm x 870 mm

Hesse Mechatronics Smart Welder combine the best of two technologies:

- The force and ultrasonic power of ultrasonic welding equipment and
- The flexibility, precision, speed and advanced process control features of wire bonding machines.

Smart Welder provide producers of medium-sized ultrasonically welded connections with increased process control and freedom of design for the next generation of capable, efficient and cost-effective designs in power electronics, battery packs and other applications.

The new Smart Welder by Hesse include precise positioning and rotation between welding tool and product, image recognition to detect the exact weld location, and derivation of an optimal trajectory to reach the weld location quickly and very precisely.

Together with long and narrow welding tools, this allows very tight spacing and thus compact products/higher power density.

Further advanced functions include touchdown sensing, precise and dynamic contact force control, diverse process control features such as monitoring of ultrasound characteristics and deformation (cf. DVS 2811), and standardized interfaces for assembly line integration.

Smart Welder can, like ultrasonic wire bonders, flexibly handle a large variety of products. New products only require a program change and possibly adapted clamping and automation.



Welded and Wire Bonded Power Module

## Large Area Ultrasonic Welding Machine

### Your benefits in the spotlight

#### Advanced features and process advantages

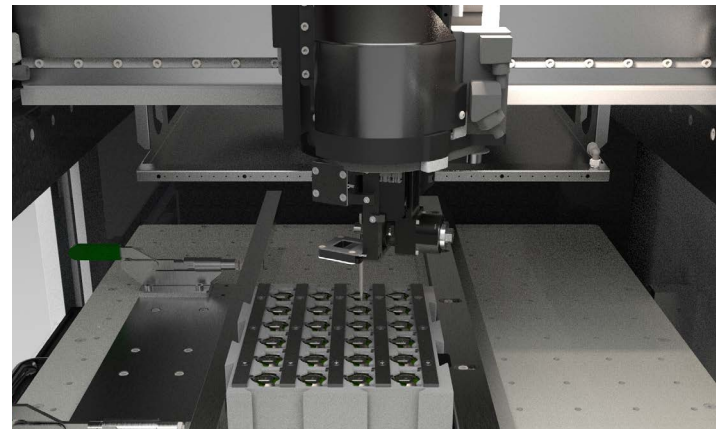
- Better UPH: Only one welding point instead of a complete connection
- Unbeatable in positioning and clearance
- Image recognition for detection and correction of the weld location
- Active vertical axis
- Wide range of US power (for flex PCB up to leadframe applications)
- Narrow pitch and deep access due to long, narrow welding tools and pattern recognition supported positioning
- Perfect US exposure by rotating weldhead
- Touchdown sensor to avoid damage to sensitive contact partner
- Precise and dynamic force control
- Programmable welding maps with multi interval processes
- Individual parameters per spot
- Flexibility to handle a large variety of products
- Standardized interfaces for line integration
- Automotive accepted process control (PiQC, patented)
- Automated bondtool calibration without wedge gauge
- Wear-free components with Piezo technology
- Maintenance-free solid state joints
- Pre-setting of weldheads

#### Flexibility

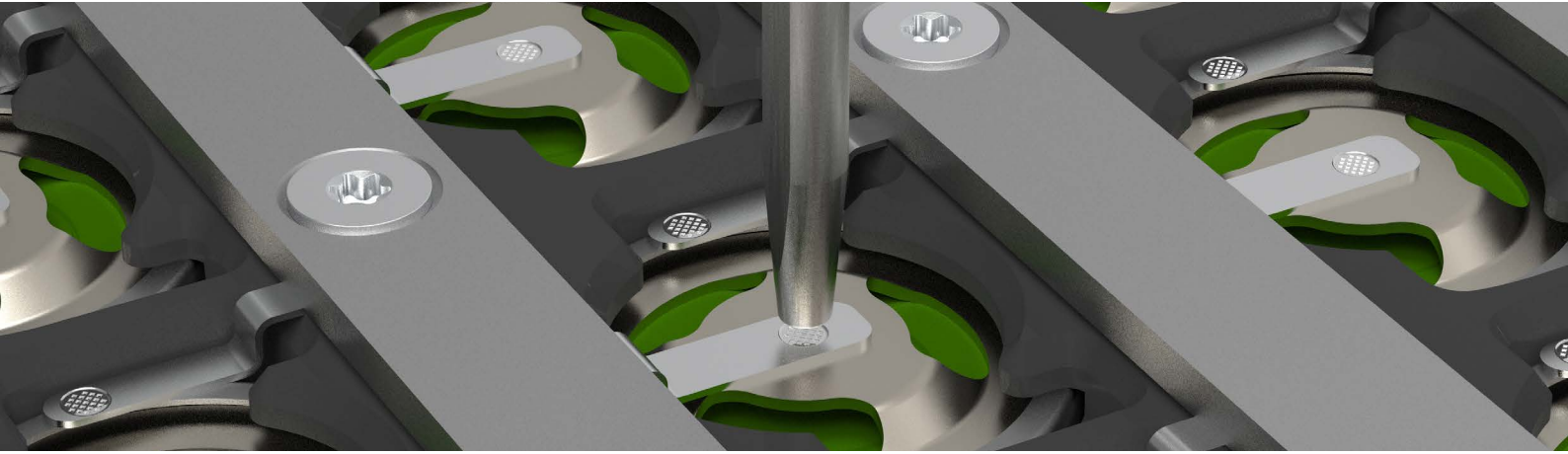
- Working area: 370 mm x 870 mm
- Flexible use of the working area, e.g. vacuum clamping
- Maximization of throughput by automation (two/more parallel lanes)

#### Quality

- 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



Mechatronic Weldhead



## Technical data at a glance

### Working area

- X: 370 mm; Y: 870 mm; Z: 42 mm
- P-axis and rotation: 440°  
(only for hybrid machines)

### Mechatronic weldhead

- From 200 W up to 1500 W

### Ultrasonic

- Wide range of US power
- Digital ultrasonic generator with PLL (Phase Locked Loop),  
internal frequency resolution <1 Hz
- Programmable ultrasonic power output

### Footprint and weight

- 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

### 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

# HESSE

## MECHATRONICS



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## 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.

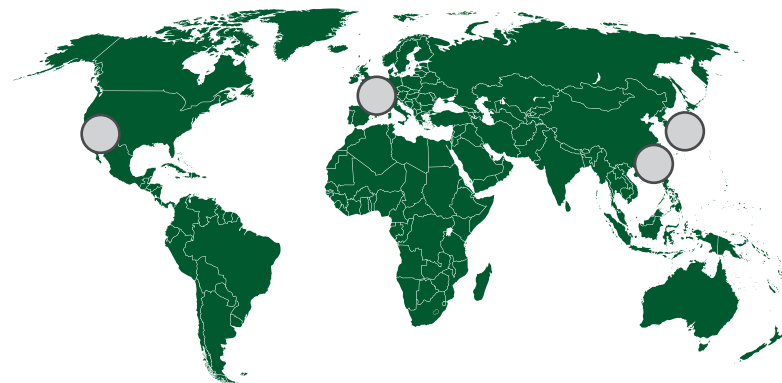
All relevant semiconductor manufacturers are among the worldwide clientel of Hesse GmbH. Distribution and service are performed from the headquarters or by subsidiaries in Hong Kong, the US and Japan and together with partners in over 30 other countries.

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](http://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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