



EastBond

Wire bonders from the OEM

MADE IN RUSSIA

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Wire bonders catalog **ES-4029** series



All our bonders are manual, with motorized Z & Y axis to perform a complete wire bonding sequence with bond termination by clamp tear or table tear.

Our bonders are wedge bonders.

Features & benefits list

The bonder is operated with a **computer mouse**. This allows to combine two types of control: by button and by lever (pedal), so two modes of operation: **manual** and **automatic** are available at the same time. Manual operation is **good for laboratories** for bonding prototypes and samples; automatic mode is optimal for **high-performance bonding a pre-series or even series** of low-loop-count microelectronic devices. Both **lab & fab** ready!



The mouse has **8 programmable buttons**. This offers a flexible, comfortable and effective operation. A **wide range of work modes** is available to optimize the work efficiency. For example, a complete bonding sequence of several favourite loop profiles can be programmed to different mouse buttons, so that the user can bond all the loops on a single device without distraction from the microscope.

Loop profile setup is interactive and mouse-aided. The user is just looking at the microscope and moving the mouse to achieve the desired loop length and height. Loop profile setup or tune-up can be done in a few seconds, during a single interactive bonding procedure with a few mouse clicks and movements, without distracting your eyes from the microscope.

The mouse allows both **right-handed** and **left-handed** operation: there's no need for hardware reconfiguration to switch hands.

Changeable bonding head: thin wire, heavy aluminium wire, deep access, even resistance welder – you can get a very cheap all-in-one bonder for all applications.



The bonding head can be replaced in a few minutes. One screw fixation.

All bond settings are digitally programmable. Bond settings and loop profiles are combined to bond presets and can be stored to bonder memory and quickly switched between.



Our thin wire bonder utilizes **high-frequency (110 kHz) and high-Q ultrasonic transducer** driven by the built-in self-tuning ultrasonic generator.

A number of researchers found out that high-frequency bonding offers better results in comparison with low-frequency (60 kHz) bonding, allowing to reduce the bonding temperature of gold wire.



Zero backlash manual cross-roller precision positioning stage offers quick and precise worktable movement and rotation:

- comfortable and precise. X-Y movement and rotation with one hand
- one-hand operation allows to increase performance;
- custom worktable top surface is possible;
- adjustable height;
- no maintenance, no adjustment, no tune-up required;
- heated & unheated worktables available.



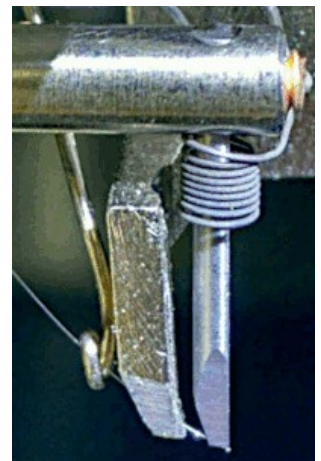
For thin wire bonder, in addition to worktable heater, **bond-tool heater** is also installed. This allows **successful gold wire bonding without worktable heating**, using bond-tool heater only (“upper” heating).

This feature is important for **difficult-to-bond applications with limited temperature range**.

Precision side wire feed offers **great wire & loop control** and allows to **bond short loops**.

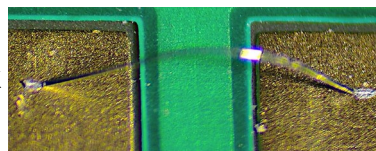
The clamping force is digitally programmed to work with different wire diameters.

The wire hole is seen on the left side of the bond wedge (not on the back side), so **initial wire insertion** into the bond tool can be **microscope-aided**. This is more comfortable.

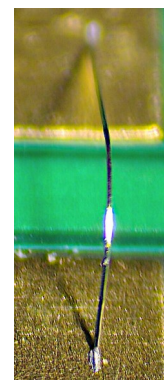


Right-to-left bonding direction offers **clear and sharp view of the whole bond loop** and all the bond points, when compared with front-to-back direction.

Automatic bond height detection guarantees the loop profile to be constant.



Right-to-left direction
(both bond points are sharp)



Front-to-back direction
(only one bond point is sharp)

Highest performance in the world within the class of manual bonders:
about **10.000 bonds/hour**.

In some cases this bonder can be more optimal and cost effective than automatic wire bonder due to its much lower price, simplicity of operation and maintenance-free.

Visit our website
for videos:
eastbond.ru/en

Maintenance-free design with minimal amount of tune-up.

Durability & reliability: no friction, no lubrication, no cooling fans, no heatsinks.

Nothing to do for mechanic and service engineer.

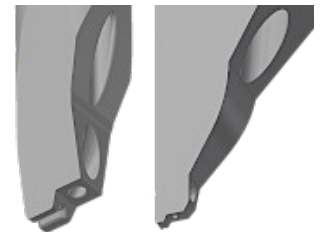
Decades of failsafe operation.

Large worktables are supported (up to 300x300 mm).

This can be useful for bonding wires on a big-size PCBs.



A low-cost customized set of WC bond tools for various wire diameters and bond lengths is available (~\$50/tool, minimum set is one tool).



Specific work modes available:

- fully automated large couplers bonding feature (for automated very short wires bonding);
 - manual and automatic stitch bonding;
 - single bond point;
 - cycling of different bond loops profile;
 - etc.
-

Trinocular optical video system option is available:

- simultaneous both-eyes microscope view and monitor live image display at the same time.
- live 30fps video with no visible delay
- 7–90x adjustable optical magnification
- HDMI interface allows to connect large flat panel (good for demonstration & educational purposes)
- mouse-aided cross-hair setup, distance measurement etc.
- photo & video capture to SD card



Very compact (400x310x360 mm = 16x12x14 in) and **lightweight** (16 kg = 35 lbs).

Most probably the smallest bonder in the world (if you find a smaller one, please let us know).

Specifications

| Wire bonder model (bonding head model) | ES-4029_{PM} [thermocompression] | ES-4029 [standard] | ES-4029_K [deep access] | ES-4029_T [heavy wire] | ES-4030 [resistance welder] | ES-4030_K [resist. welder deep access] |
|---|--|---|---|--|---|--|
| Bond type, wire type, bond tools | | | | | | |
| Bond type & method | thermocompression | ultrasonic, thermosonic | | ultrasonic | resistance welding | |
| | wedge-wedge | | | | | |
| Wire diameter | 15–100 μm 0.6–4.0 <i>mil</i> | 15–75 μm 0.6–3.0 <i>mil</i> | | 80–300 μm 3.0–12 <i>mil</i> | 15–75 μm 0.6–3.0 <i>mil</i> | |
| Wire material | gold | aluminum, gold | | aluminum | gold | |
| Bond tool diameter | 1.58 <i>mm</i> 0.0624" | | | 2.5 <i>mm</i> 0.098" | 3.0 <i>mm</i> 0.118" | |
| Bond tool length | 0.625–1.4" 15–35 <i>mm</i> | min. 0.590" min. 15 <i>mm</i> | 0.625–1.4" 15–35 <i>mm</i> | 0.708–1.0" 18–26 <i>mm</i> | 25±1 <i>mm</i> | min. 25 <i>mm</i> |
| Bond tool drop value | n/a | 11±1 <i>mm</i> | min. 11 <i>mm</i> | min. 13 <i>mm</i> | n/a | |
| Wire feed direction | none | side | vertical | vertical | side | vertical |
| Wire clamp type | none | movable | unmovable | unmovable | movable | unmovable |
| Bond termination method | none | clamp tear / table tear | table tear | table tear | clamp tear / table tear | table tear |
| Bond force, temperature | | | | | | |
| Bond force ^(a) | 30–300 <i>grams</i> | 30–300 <i>grams</i> | 30–300 <i>grams</i> | 50–400 <i>grams</i> | 30–300 <i>grams</i> | |
| | Electronically programmable range: 100 <i>grams</i> | | | | | |
| | 1 st and 2 nd bond force can be set individually | | | | | |
| Heating worktable ambient temperature | up to 350 °C | up to 170 °C ^(a) | | | | |
| Heating bond tool ambient temperature | up to 200 °C | up to 170 °C ^(a) | | not heated | | |

(a) greater values are possible upon request

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|---|--|------------------------------|---|--|---------------------------------------|--|
| Bond impulse | | | | | | |
| Bond impulse power | — | up to 10 W | up to 10 W | up to 30 W | up to 100 W | |
| Bond impulse voltage | — | — | | | 0–2 V | |
| Bond impulse frequency | — | (64 ± 4) kHz / (110 ± 4) kHz | | (64 ± 4) kHz | — | |
| Frequency auto tuning | — | digital, ± 1 Hz accuracy | | | — | |
| Bond impulse duration | 25 – 3000 ms | | 0 – 1000 ms | | | |
| Lengths, depths, strokes | | | | | | |
| Motorized Z & X axis stroke | Z: 7 mm, X: 7 mm | | | | | |
| Manual XY movement | Gross: 85 × 85 mm, Fine: 22 × 22 mm | | | | | |
| Maximum fixed workpiece width | <i>for heated worktable</i> | — | 28 mm | | | |
| | <i>for unheated worktable</i> | — | 40 mm | | | |
| Reach depth (depending on tool length L) | 21 mm | — | (L–4) mm (L–7) mm ^(b) | — | 20 mm and more | |
| Binocular optical system (standard) | | | | | | |
| Magnification | 20x / 40x, switchable | | | | | |
| Focus distance | 93 mm | | | | | |
| Trinocular video optical system (optional) | | | | | | |
| Optical magnification | 14x – 90x, zoomable | | | | | |
| Microscope head focus distance | 100 mm | | | | | |
| Camera frame rate | 30 fps | | | | | |
| Camera image delay | 50 ms max | | | | | |
| Camera resolution | 1920x1080 (FullHD) | | | | | |
| Camera output interface | HDMI | | | | | |
| Monitor size | 7" | | | | | |
| Features | photo & video capture to SD-card, mouse-aided crosshair setup, distance measurement etc. | | | | | |
| Binocular / trinocular view switching method | no switching: simultaneous view | | | | | |

(b) these values are given for heated bond tool

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|--|---|------------------------------|---|--|---------------------------------------|--|
| Control, display, features, performance | | | | | | |
| Z axis control | manual & automatic by computer mouse; electronic foot pedal (optional) | | | | | |
| XY axis control | manual zero-backlash cross-roller micro manipulator | | | | | |
| Machine control | 8 programmable mouse buttons, 16-button keypad | | | | | |
| Parameters displayed on the screen | <i>bond program parameters:</i> 1 st , 2 nd bond levels, bond duration, bond force, bond program No; <i>last bond measured parameters:</i> impedance / current / power / Q (selectable); <i>ambient temperatures:</i> heating worktable, bond tool The above parameters are displayed all together in work mode. | | | | | |
| Loop profile programming | mouse-aided, interactive | | | | | |
| Performance | up to 10 000 <i>bonds/hour</i> | | | | | |
| Loop forming | manual | automatic, manual | | | | |
| Bond programs stored in memory | 10 | | | | | |
| Right-handed, left-handed operation | computer mouse allows both: no reconfiguration needed | | | | | |
| Dimensions & facility | | | | | | |
| Electrical | ~(180 – 264) V / ~(90 – 132) V, 47 – 63 Hz | | | | | |
| Power consumption | 18 – 70 W | | | | | |
| Dimensions (<i>length × width × height</i>) | 400 × 310 × 360 mm = 16 x 12 x 14 " | | | | | |
| Net weight | 16 kg = 35 lb | | | | 18 kg = 39 lb | |