

Открытое акционерное общество
«Планар-СО»

(ОАО «Планар-СО»)

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Open Joint Stock Company
«Planar-SO»

(OJSC «Planar-SO»)

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Minsk, Republic of Belarus

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№ _____
на _____ от _____

Commercial offer

Open Joint Stock Company "Planar-SO" was founded in 1962 as a part of the High-precision Electronic Engineering Design Department (KBTEM). Nowadays our main business is design and manufacture of special technology equipment for assembly of semiconductor devices, integrated circuits, microelectromechanical systems and other electronic devices. The target group of marketing coverage are public and private enterprises engaged in the production, research and development in the field of microelectronics.

The company produces an extensive list of equipment to perform technological operations in the field of microelectronics, such as:

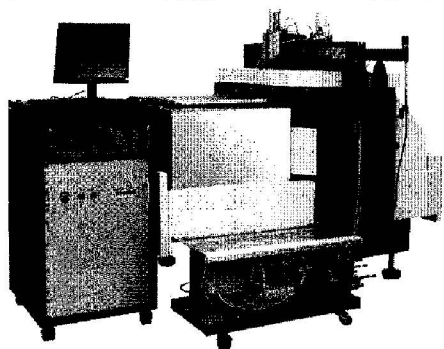
- Wafer grinding;
- Die bonding;
- Die inspection and cassetting;
- Wire bonding;
- Laser processing.

A detailed list of the company's products can be found on our website: <http://www.kbtm.by>.

Our prospective developments include the following positions:

Mechanical wafer polishing machine EM-2090

(harmonization code - 8486 20 900 9)



The machine is intended for grinding and polishing of semiconductor wafers.

Wafer diameter – up to 200 mm

Roughness after processing – Ra 0,04 mm

Wafer nonflatness:

200 mm – 5 µm

150 mm – 4 µm

100 mm – 3 µm

Estimated EXW cost - \$ 151 710 (VAT not included)

Die and SMD bonder EM-4605

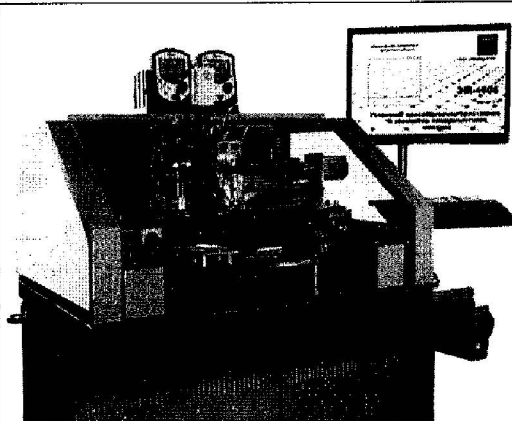
(harmonization code - 8486 20 900 9)

The bonder is intended for bonding of dice and surface-mount devices (SMD) with the use of glue or solder paste for multi-dice and multi-level assembly of electronic products such as "system in case (microwave and MST devices).

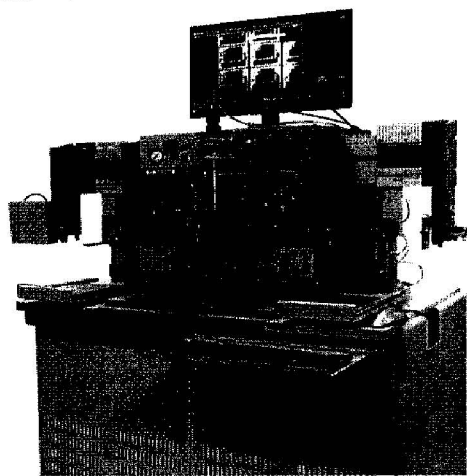
Die size - 0,4x0,4 - 25x25 mm

Bonding accuracy, on X, Y axes - ± 0.020 mm

Estimated EXW cost - \$ 83 500 (VAT not included)

**Die Bonder EM-4505**

(harmonization code - 8486 20 900 9)



The bonder is intended for automatic die bonding with glue while producing semiconductor equipment in ceramic bodies with the use of satellite cassettes.

Wafer diameter – up to 200 mm

Die size – 0.25x0.25 - 20x20 mm

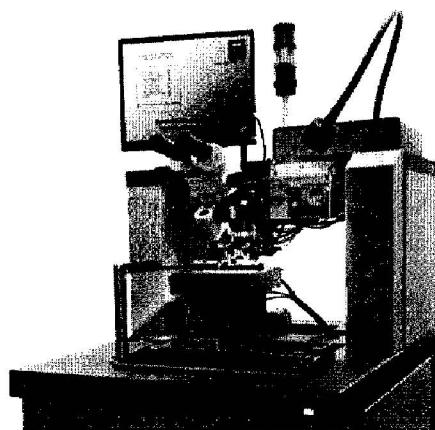
Bonding accuracy:

- on X, Y axes ± 0.05 mm- on ϕ angle $\pm 5^\circ$

Estimated EXW cost - \$ 102 850 (VAT not included)

Discrete Cases Wire Bonder EM-4550

(harmonization code - 8486 20 100 0)

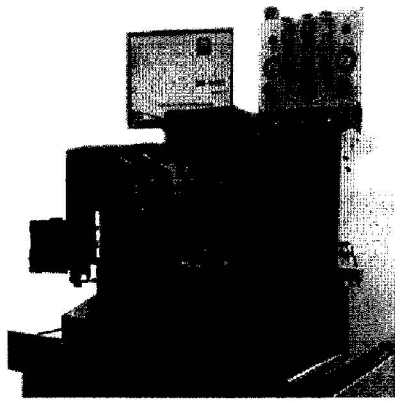


Discrete Cases Wire Bonder EM-4550 is intended for automatic bonding of gold wires in semiconductor equipment using the thermosonic "ball-to-wedge" bonding method.

Working area – 200x150 mm

Bonding accuracy $\pm 4,5$ μ m

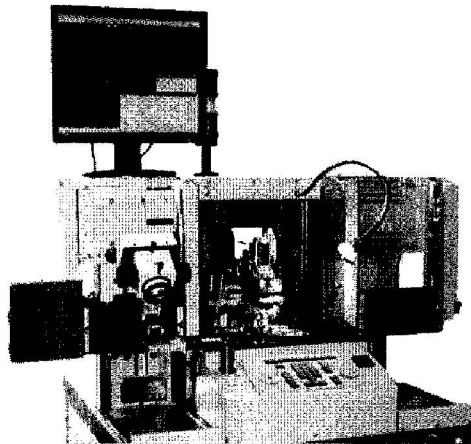
Estimated EXW cost - \$ 86 550 (VAT not included)



The bonder is intended for the assembly of electronic devices, made in the sections of packages and packages located in the satellites and moved along the working position of connecting the leads from the store to the store.

Bonding method – thermosonic “ball-to-wedge” bonding

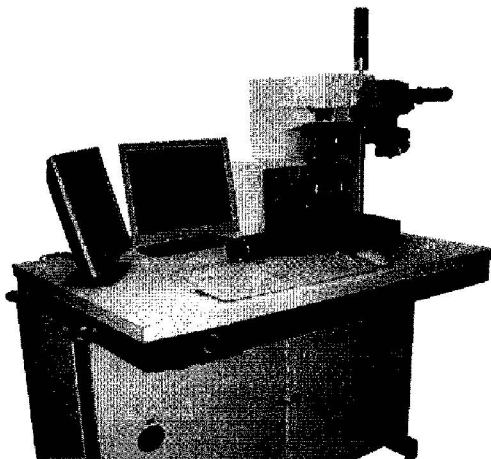
Estimated EXW cost - \$ 84 700 (VAT not included)

Automatic Wire Bonder EM-4020PM (harmonization code - 8486 20 100 0)

The bonder is intended for bonding wires of aluminum to the contact platforms of the die and hull by overlapping ultrasonic welding.

Bonding method – ultrasonic “wedge-to-wedge” bonding

Estimated EXW cost - \$ 99 260 (VAT not included)

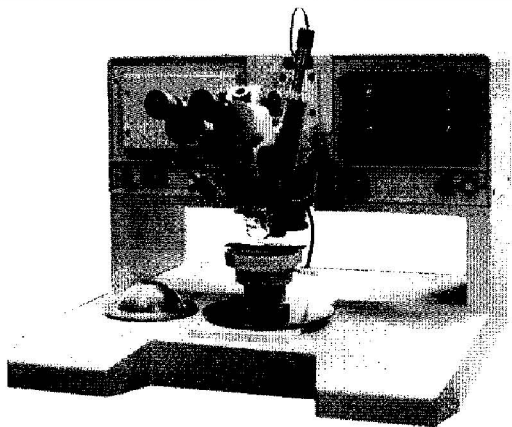
Automatic Wire Bonder EM-4371 (harmonization code - 8486 20 100 0)

The ultrasonic very large scale ICs wire bonder EM-4371 is intended for automatic “wedge-to-wedge” bonding of aluminum and gold wires in a large range of products that require vast working area and high accuracy, including multi-wire, multi-dice and multi-level products using the ultrasonic overlapping bonding.

X-Y working area size -150×100 mm

Bonding method – ultrasonic “wedge-to-wedge” bonding

Estimated EXW cost - \$ 63 670 (VAT not included)



The bonder offers tremendous opportunities for wire bonding in a wide range of electronic devices. The bonding can be performed by "wedge-wedge" and "ball-wedge" methods, using thermosonic / ultrasonic or contact bonding.

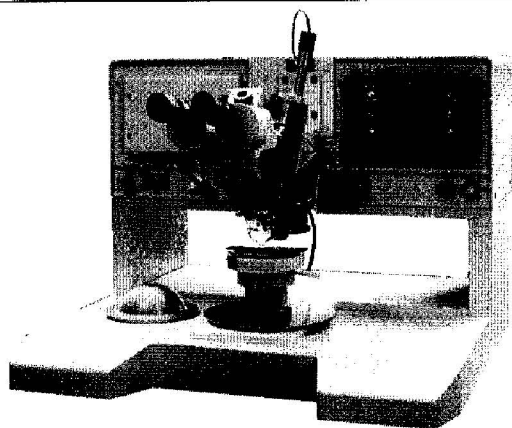
Bonding methods:

- thermosonic "ball-to-wedge" bonding
- ultrasonic "wedge-to-wedge" bonding
- contact "wedge-to-wedge" bonding

Estimated EXW cost – \$ 40 370 (VAT not included)

Wire Bonders EM-4321, EM-4322, EM-4323, EM-4324

(harmonization code - 8486 20 100 0)



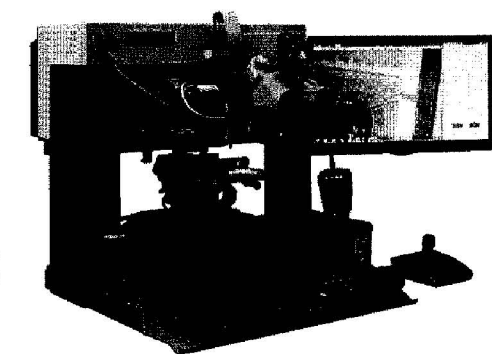
The bonders are intended for manual automated assembly of electronic devices with different types of wires and bonding methods.

Bonding methods:

- EM-4321 - thermosonic "ball-to-wedge" bonding
- EM-4322 - ultrasonic "wedge-to-wedge" bonding
- EM-4323 - ultrasonic heavy wire "wedge-to-wedge" bonding
- EM-4324 - contact "wedge-to-wedge" bonding

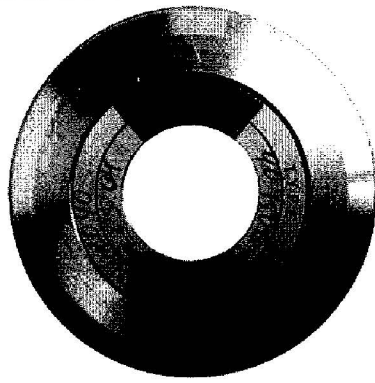
Estimated EXW cost – \$ 34 275 – 36 830 (VAT not included)

Strength Control Unit EM-6705 (harmonization code - 8486 20 100 0)



The unit is used to control the strength of wire jumpers in electronic products, as well as control the shear strength of bulk leads and determine the relative elongation of the wire.

Estimated EXW cost – \$ 26 670 (VAT not included)



The wheels with diamond dicing blade deposited on aluminum body with nickel binder by electrolytic method are intended for dicing wafers made of materials used in microelectronics.

Standard fitting and outer diameters allow using the wheels with any dicing equipment.

Estimated EXW cost – \$ 23 - 55 (VAT not included) depending on wheels type

Every position of our product range can be modified and adapted in accordance with the needs of the customer.

The above stated cost of equipment is indicative and depends on a number of factors, incl. the presence or absence of certain options, need for improvements to meet special requirements of the customer, timing of delivery of the equipment, etc., and is discussed in each case individually. Terms of delivery are discussed in each case individually.

All products are covered by warranty. Overseas warranty service is possible and is a common practice.

Sale of equipment is possible on any mutually beneficial terms, incl. direct negotiations, participation in tenders, etc.

The company possesses an ISO9001 certificate of conformity certifying that the quality management system applied to the design, development and production of equipment used in the enterprise complies with the requirements of STB ISO 9001-2009. The produced equipment has registered declarations of compliance with technical regulations (TR) of the Customs Union (TS):

- TR TS 004/2011 "On the safety of low-voltage equipment";
- TR TS 010/2011 "On the safety of machinery and equipment";
- TR TS 020/2011 "Electromagnetic compatibility of technical equipment"

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We appreciate all forms of cooperation!



Commercial proposal Public Corporation "Radiovolna"

Public Corporation "Radiovolna" the resident of free economic zone "Grodnoinvest",

a diversified industrial enterprise, than 40 years working in mechanical engineering branch. Comfortable conditions for business dealing on border with the European Union countries and the CIS are created for the enterprise as for the resident of free economic zone. The Republic of Belarus is a member of the Customs union with Russia and Kazakhstan that allows to build cooperation with the foreign companies on more beneficial terms.

Different types of production:

- machining process and mechanical assembly production;
- forming production;
- production of nonferrous castings parts
- production of electroconductive harnesses for cars Volkswagen;
- electroplate production;
- putting galvanic and paint and lacquer coating;
- tool production;

The list of basic production:

- automobile and tractor generators;
- heat exchangers;
- discharge gas recycling cooler;
- set of closure system;
- fans;
- mechanicand plastic details of engines;
- electroconductive harness for cars;

The products are manufactured by HS code :

- 8511 50 000 8 «automobile and tractor generators»;
- 8708 91 990 9 «heat exchangers»;
- 8409 99 000 9 «discharge gas recycling cooler»;
- 8301 20 000 9 «set of closure system»;
- 8414 59 800 0 «fans»;
- 84009 99 000 9 «mechanicand plastic details of engines»;
- 8544 30 000 7 «electroconductive harness for cars»;

For complete information about products are available in our price (annex 1), as well as on our website www.radiovolna.com.by.

The high level of organization of production of "Radiovolna" " confirmed by the certificate of quality management system STB ISO 9001-2015, IATF 16949.

An enterprise offers the flexible terms of collaboration with the individual going near every customer. Applied system of discounts depending on the volumes of the acquired products, terms and terms of payment.
Public Corporation "Radiovolna" has the highly skilled technical, industrial stuff.

We invite you to mutually beneficial cooperation!

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