

Diamond Thermo-compression Bonding® (DTHB)

Long-life Diamond Tips 1'000'000 and more bonds

The best and exclusive patented connection technology of fine wire to pins, pads, flex-circuits and PCB's

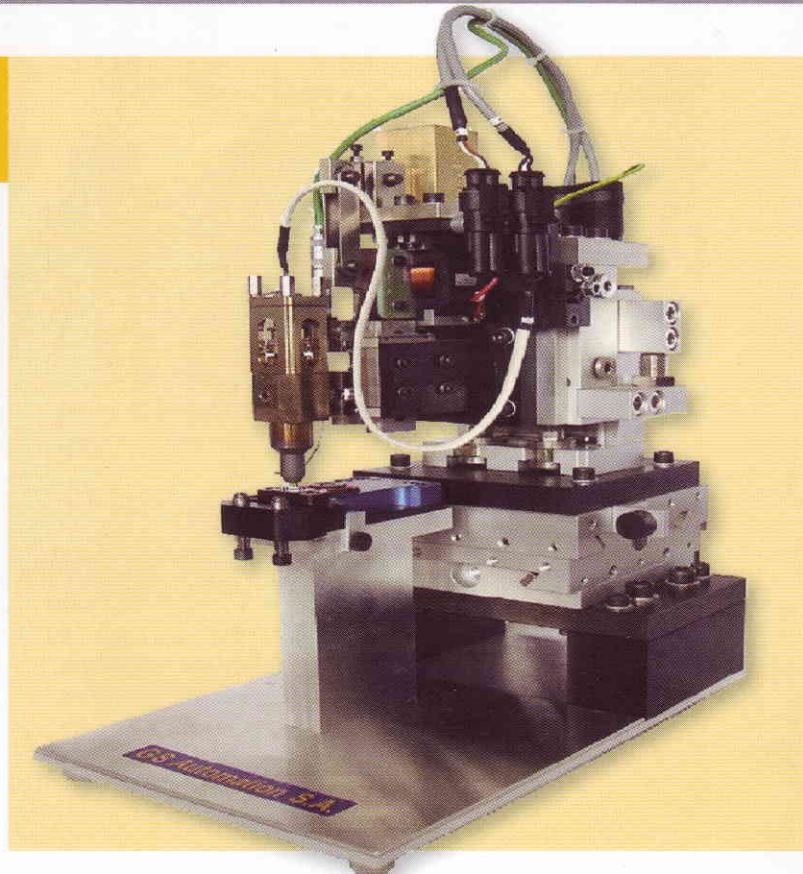
- Bonding hyper fine wire from **10 µm (0.0004")**
- **Low temperature** range system, between **400 to 600°C**
- **No premature heat ageing** of components
- **Solder / flux free**
- Only **200 m/sec** for a **10 µm** copper wire connection
- **Life cycle over 1 million bonds!**

When it comes to fine wire applications and high precision, choose the best connection technology of fine wire to pins, pads, flex-circuits and PCB's.

Our DTHB System uses a diamond tip (DTHB/ITASCA patent), which has the impressive advantage of having life-cycles between 600,000 and 1,200,000 bonds, depending on the materials used. This product life-cycle experience is based on more than 300 DTHB-systems delivered worldwide. Other Thermo-Compression systems use thermodes at roughly 1000 °C, having a life cycle of 200 to 300 times less than ours.

DTHB-Engineering, a division of **DTHB-Automation**, also supports your R&D Department in the development phase of your innovative product and works out solutions to your problems.

We have a unique world expertise in the processing of hyper fine wire coils and the micro interconnection using our patented **DTHB System**.



DTHB Head

The DTHB Head design is based on a very high level of flexibility. It can be used as part of an integrated transfer system, or as a stand-alone assembling unit for production and development.

TECHNICAL SPECIFICATIONS

Number of heads	1 - 8 *
Wire Ø	10 µm - 200 µm *
Temperature	400 - 600 °C
Air Pressure	5 - 6 bar
Electrical supply	1 x 230 V / 6 A
	50 / 60 Hz
Control	NC / PC

OPTIONS





Tooling nests for	Chips, Modules, Flex-prints, pads, etc.
Suction for scrap wire removal	
1-3 servo-axis for DTHB head movements	
Servo-axis	3 phases 380/415 V 16 A
Pallets for parts	
Handling systems for Pick & place for loading / unloading	

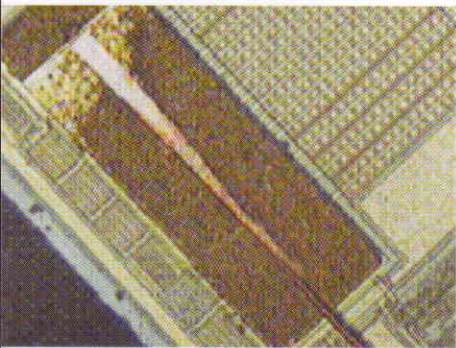
*Other specifications available upon request



DTHB-Automation S.A.R.L. - 50 Av de la Praille
CH-1227 Carouge, Geneva-Switzerland
Tel: 00 4122 300 61 73 - Fax: 00 4122 300 61 75
E-mail: sales@dthb-automation.com

www.dthb-automation.com

Thermocompression Bonding Head		Cabinet	Labo	Integrated Basic	Industrial	
Performances	Wire diameter 10 μm - 200 μm	+	+	+	+	
	Temperatures ranges 400°C - 600°C	+	+	+	+	
	Micrometric position Range 0 - 15mm	+	+	+	+	
	Automatic position Range 0 - 15mm		+	+	+	
	Positioning accuracy +/-0,01 mm		+	+	+	
	Integrable in automated system			+		
Number of Head		1	1	1	1 to 8	
Specifications	Electric supply V	DTHB - Head / Servo-axis	230 / 451	230 / 451	230 / 451	451
	Intensity A	DTHB - Head / Servo-axis	6 / 16	6 / 16	6 / 16	6 / 16
	Frequency		50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
	Pneumatic Bar		5 - 6	5 - 6	5 - 6	5 - 6
Command	Automate or PLC	Auto or PLC	PLC	Auto or PLC	PLC	
Definition	Thermocompression bonding is a process that involves the use of pressure and temperature to join two materials by interdiffusion across the boundaries					



Thermocompression bonding works on the basis of one of the physical properties of electrical conductors - their atoms are able to diffuse into another material and vice-versa.

Like any solid material, the conductor becomes soft within a certain range of temperatures. This range of temperatures is different for each material, and when reached, it enables the atomic structure of the two elements to join together by diffusion.

This rate of diffusion is almost nil at ambient temperatures, so the application of heat is necessary in order to accelerate the process, so sufficient diffusion is achieved to produce a bond within approximately some tenths of a second.

Pressure applied to the materials being bonded ensures an excellent contact between their two surfaces to further promote the atomic diffusion process. The wire and the pad are then strongly linked together by the atomic connections created during the diffusion process.

Here are a few pictures of hyper-fine wire bonding made with our DTHB System :

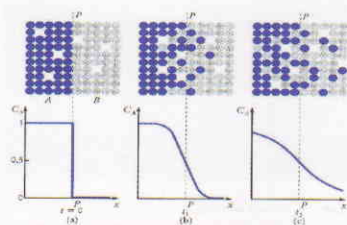
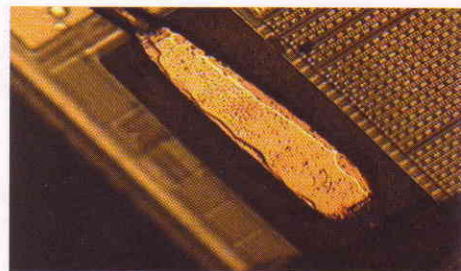
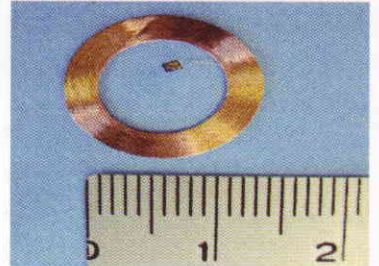
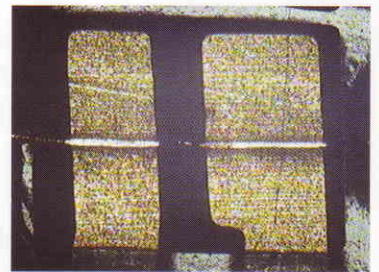


Diagram of Diffusion

Diffusion of the blue atoms (ex: Copper wire) and white atoms (ex: Gold plated pad) during the process of Thermocompression Bonding.

