

InduBond® 130N Inductive Bonding Machine



InduBond®, High Accuracy Pin Registration Machine For Pin Less Lamination

- > Inductive bonding points to hold the layer to layer registration.
- > High precision layer to layer Pin registration.
- > The bonding points withstand the movements of the inner layers during the hot press cycle.
- > It assures the best linear movements of the multilayer stack-up caused by thermal dilatations/shrinkage during lamination.
- > It reduce the internal mechanical stress of the multilayer stack-up thereby reducing the warping effects.
- > Constant and precise thickness over the entire surface. The flat bonding points allow maximum and uniform pressure during the press cycle.
- > Guarantee press plates long life and reduce cost of tooling plates, pins, bushings... (No more hard tooling plates!)

General Description

InduBond® 130N is a new generation of the inductive bonding machines by Chemplate for layer to layer pin registration and bonding the stack-up of inner layers and prepregs of a multilayer printed circuit. This process allows to laminate the multilayer boards without the needs of the pins and hard tooling plates.

The process allows repeatability and reliability obtaining high registration precision between the inner layers (Tooling template accuracy <math><10</math> microns). The multilayer stack, previously mounted on a tooling template with high-precision mechanical pins, is bonded by **InduBond®** technology using 4 **InduBond®** heads (optional, 6 heads), which uniformly press and heat the bonding spots in all the inner layers until the prepreg resin is fused, thereby guaranteeing the bonding of multilayer stacks of up to 10-mm thick.

The tooling plate is customize, could be 2 round pins, 3 round pins, multi round pins, 3-4 slot pins or a combination; the tooling templates are light and removable (not fixed to the machine). The resulting bonding spots are flat, without over-thickness. They are capable of withstanding the dilations and shrinkage of the hot press cycles, thereby providing the best possible linear movement of all layers in a multilayer stack-up, reducing the internal stress that cause warping and deformations and moreover, reducing the distortions and misalignments between inner layers.



Technical Requirements

- A high precision tooling template with mechanical pins is used for the lay-up and registration.
- The inner layers must first be prepared with the corresponding registration holes (See Figure 1). These holes are generally drilled or punched post etch.
- The prepreg must also have holes for the pins. These holes do not have to be precise, and they can be 1 or 2 mm larger than those of the inner layers.
- The inner layers must have heating circuits etched in the reserve zones on both top and bottom sides. (See Figure 1&2).

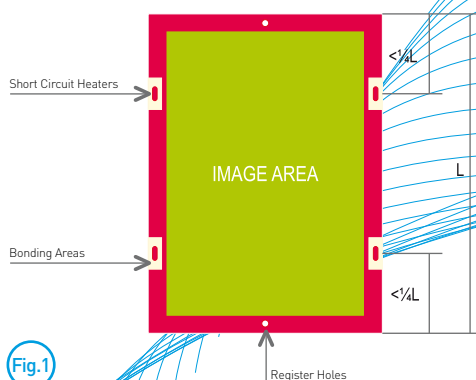


Fig.1

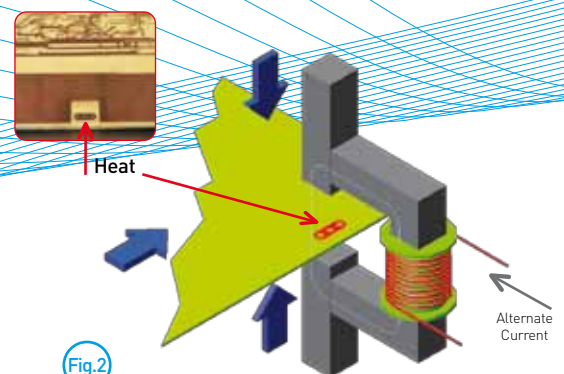


Fig.2

Technical Data

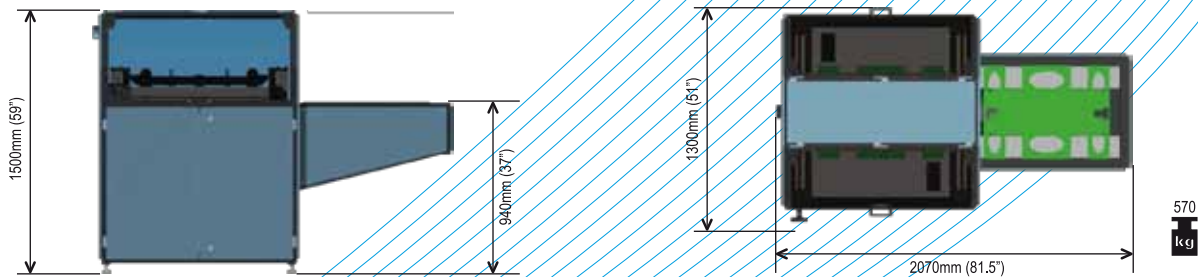
- Weight: 570Kg. (1256 lb)
- Max. Inner Layer Size: L.750 x W.650 mm (30x25")
- Min. Inner Layer Size: L.250 x W.250 mm (10x10")
- Max. Bonding Thickness: Up to 10 mm
- Installed Power: 3Kw (400 Volt - 3ph+N+G - 50Hz)
- Air Pressure: 6 bar (90 psi)
- Suction Hole: 80 mm diameter (3,15")
- Suction Flow: Min. 160 l/s

Procedure Description

1. Place the internal layer #1 on the pins over the Tooling Template.
2. Put on the prepreg sheets required for the stack-up.
3. The machine automatically move the tooling template with the multilayer stack-up to the bonding zone.
4. Repeat step 1 and 2 until the multilayer stack-up is completed.
5. Once the stack-up is complete, the operator must confirm by a foot switch.
6. The machine closes the top plate (press) to keep the stack-up firmly flat and to ensure the correct lay-up alignment of all inner layers.
7. The Inductive Bonding Heads (InduBond®) close the electrodes, and the bonding cycle begins.
8. Once the Bonding cycle has ended, the machine moves the tooling template with the multilayer assembly to the initial position and pins retract automatically to manually remove the bonded stack-up.
9. Repeat the process.

(The typical bonding time for an 8 layer stack is approximately 45-60 Sec.)

Machine Layout



Standard Composition

The standard composition includes:

- Inductive Bonding Machine (InduBond® 130)
- 4 Inductive Bonding Heads and controls.
- Dedicated tooling template (according customer requirements).
- Instructions book.
- Technical data to prepare the inner layers.
- Installation and training.
- Technical support.



Optional

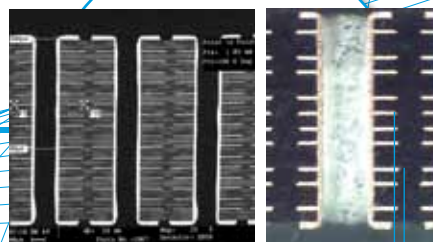
Some options are available:

- 2 Additional Inductive Bonding Heads and control. [Recommended for big panel, 610-762 mm [24-30"]].
- Automatic Heads positioning (servo motor).
- PC software controlling and remote control.
- Pre-Assembly station with 2 registration tooling templates (Fig.3). (This option allows to double the machine production with low cost).



Alignment Accuracy

Cross section of typical registration results on high layer account.



14um



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