

InduBond® PLR

Inductive Bonding Machine

> **NEW** <



InduBond®, High Accuracy Optical Registration System for Pin Less Lamination

- > High precision layer to layer optical registration.
- > Inductive Bonding Technology (InduBond®) to assure best registration.
- > The bonding points withstand the movements of the inner layers during the hot press cycle.
- > No post etch punching or post etch drilling process is necessary.
- > Best registration accuracy with 8+4 CCD cameras system for the new optical alignment system.
- > Inner layer front to back image registration and inner layer geometry shape measurement for quality control and statistic alignment compensation.
- > High Cost reduction, not tooling holes process, not hard tools for inner layers registration.
- > All the accumulated tolerances of the traditional post etch punch and pin lamination tools systems are eliminated.
- > Four bonding heads working simultaneously and independent with X/Y movement to place bonding locations for fixing the registration prior to lamination in any location of the PCB.
- > Bonding locations are loaded directly from the Gerber files.
- > All laminates materials can be bonded (FR4, Htg FR4, Rogers, Polyamide...).
- > Fully automated process.

General Description

InduBond® PLR is the new equipment that has been developed to allow Pin Less Lamination of multilayers and also for sequential lamination built up technology. The complete registration process is made in the PLR unit: Lay-up the multilayer Stack-up, layer to layer optical registration and final welding to hold the registration.

In the **InduBond® PLR** process the mechanical tolerances of the inner layers post etch punch or drill locations of the tooling holes, the tooling hole size, lamination plate bushing locations and pin size are eliminated because the **InduBond® PLR** use fiducial targets etched in the layers to align through image processing via CCD cameras. This process result in lower manufacturing and maintenance cost due to the elimination of the Pins, Bushings and tooled separator plates on the lamination process. The recognized today's best fit on Pin Lamination technology guarantee around 50µm for layer to layer registration, the **InduBond® PLR** measures each layer to get the front to back image registration as well the geometry shape of each core and can align inner layers with a tolerance of ±15µm while each core is individually inspected and can be rejected as quality control according to a tolerances.

This new generation of the **InduBond® PLR** provide also a capability to place multiple number of bonding points in any location of the multilayer stack for best registration. The bonding points could be place it anywhere in the edges or inside the image area of the multilayer panels. Those bonding spots works as virtual pins to help the scale constrain, similar as multiple tooling pins around of single PCB.

This machine can bond all the new laminated materials that you actually can press.

The bonding points can be place anywhere in the CAD design, the machine is capable to read and decode the Gerber file jobs and automatically know the coordinates for each bonding location of the panel.

Four bonding heads with independent movement in X and Y axis allow the movement of each head to any location and provide fast speed for complex panels that require many bonding locations for best registration and multilayer handling. Optionally the registered and bonded multilayer panel could be automatically unloaded at rear unloading station that could be equipped with a trolley. Also optionally one plastic protection sheet can be automatically inserted between each panel. The machine concept is fully automated and can be upgrade with options.

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.

All the improvements of our very well know **InduBond®** patented technology where realize:

Less registration distortion.

Better final thickness stability over the panel.

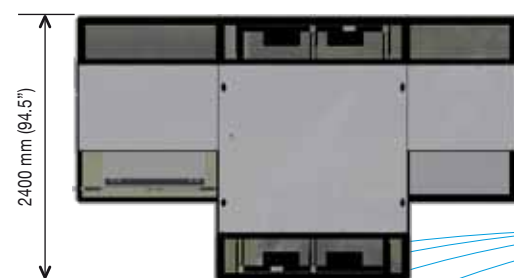
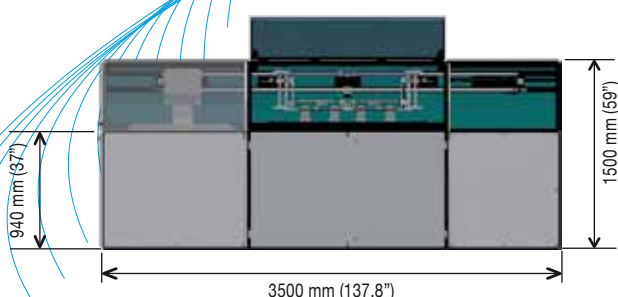
Better panel planarity or less warpage.

Better press distribution and topography.

The welded stack-up multilayer can be X-Ray to check before and after lamination.



Machine Layout



980
kg
2160 lb

Technical Data

Process Specifications:

Max. Inner Layer Size: L.750 x W.610 mm (30x24")
Min. Inner Layer Size: L.304.8 x W.304.8 mm (12x12")
Max. Bonding Thickness: Up to 10 mm
Min. Bonding thickness: No limit
Min. Layer thickness: 25µm (1 mil)
Alignment accuracy: ±15µm
Repeatability: ±5µm
Number of cameras: 4 or 8+4CCD
Max. Bonding temperature: 350°C (662°F)

Electrical Connection:

3ph+N+G 400VAC 50Hz/60Hz
Installed Power 6000W
Peak Current 11A
Main wires section 4 mm²
External protection 16A

Air pressure Connection

Max. pressure 10bar
Working pressure 6bar
Inlet plug size Ø8 mm
Air Consumption approx. 16m³/hour (10CFM)

Water cooling connection

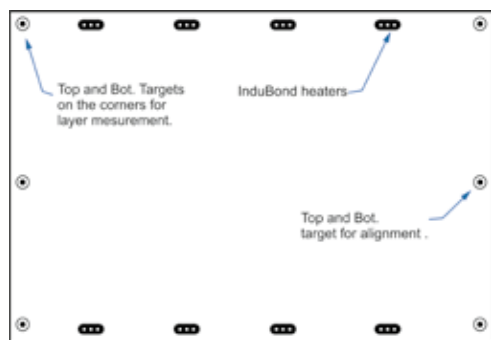
Inlet plug size Ø12 mm
Outlet plug size Ø12 mm
Min. Input Temp. 10°C
Max. Input Temp. 18°C
Min. Flow rate 100 liter/hour
Internal chiller through by-pass

External noise

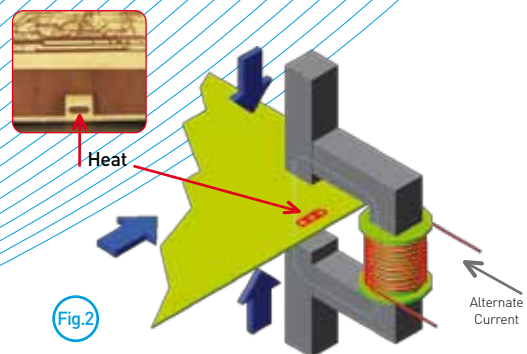
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Technical Requirements

- The inner layers must first be prepared with the corresponding fiducial targets on top and bottom side for the optical alignment. (See Figure 1).
- The PrePreg no need any hole/punch.



- The inner layers must have heating circuits etched in the reserve zones on both top and bottom sides. (See Figure 2). And can be placed anywhere along the short, large edges of the galvanic frame or inside the image area.



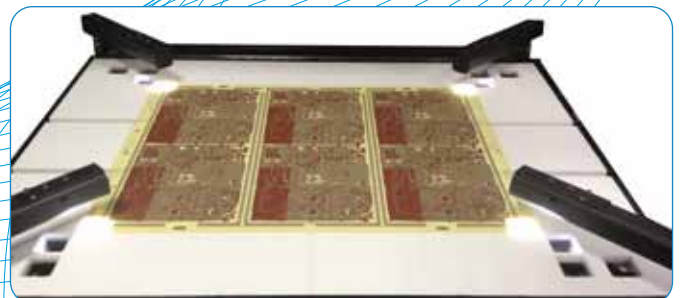
Standard Composition

- Inductive Bonding Machine (InduBond® PLR)
- Loading / Unloading station.
- Transfer unit with automatic panel size adjustment.
- 4 moveable, dependent Inductive Bonding Heads and controls.
- Top vacuum plate with 2CCD cameras.
- Bottom high accuracy alignment table with 2 CCD cameras.

- PC, windows 7 Pro, 19" TFT Ethernet and remote control.
- Instructions book.
- Technical data and guide to prepare the inner layers.
- Installation and training.
- Technical support.

Optional

- Measuring table for loading station with 4+4 CCD Top and bottom to measure front to back image registration and shape geometry with statistical registration system for best fit.
- 4 moveable, independent X/Y axis Inductive Bonding Heads and controls.
- Automatic unloading station with stacker.
- Plastic sheet dispenser and automation to insert in between each register panel on the stacker.
- Traceability control system to store process data in data base
- Bar Code or QR reader to automatically call job parameters.
- Internal close loop chiller.





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