

REGISTRATION BONDING MACHINE mod. RBM HP

The HP version allows the bonding in masked-time for higher throughput



PREMISE:

The last generation of bonding machine developed by **PLURITEC** is based on the new heating concept, not requiring to apply pressure to transfer the heat thus avoiding any signs, dents nor picks on the core book

(core definition: a double side thin laminate with two inner-layers).

The new concept grants the proper temperature reaching in both **vertical and horizontal dimensions**. The new principle allows a reduction of the total **bonding time up to 50%** against the traditional heating systems based on electrical resistance heating and pressure application.

The power requested is strictly limited to the bonding time, thus **saving up to 60% of the running power costs**.

GENERAL DESCRIPTION:

The **RBM HP** makes the coupling of the various layers to be processed in the Hot Presses. It uses alternatively two templates where the layers are held in a precise positions by 4 pins. The layers will be stuck together by 4 or 6 pairs of welding heads acting like pliers to grip the layers and fuse the resin in the 4 or 6 peripheral areas of the pre-preg.

While the operator builds-up a sandwich, the previous one is in the bonding cycle, thus improving the throughput.

The bonding areas of the cores (4 or 6 locations) must be provided on both sides of each layer with a copper pattern, so optimizing the bonding of the sandwich; the Gerber file of the pattern is supplied with the **RBM HP**.

OPERATION SYSTEM :

The cores require the registration-tooling holes \ slots, which are typically made by either a punching machine, such as a Post Etch Punch, or better by a drilling machine based on X-ray optimizer, as **Inspecta** from PLURITEC, for the edges of the holes and their position accuracy. The use of an X - ray machine provides the optimization of the front to back artwork offset, contrary to any Post Etch Punching machine. The pre-preg has the same dimensions of the inner-layers to be bonded, but it requires holes allowing the registration pin passing through. The pre-preg are sized to cover the 4 bonding areas of the inner-layers.

The temperature in every single bonding area is displayed and controlled by temperature controllers.

The bonding procedure consists of the following three steps:

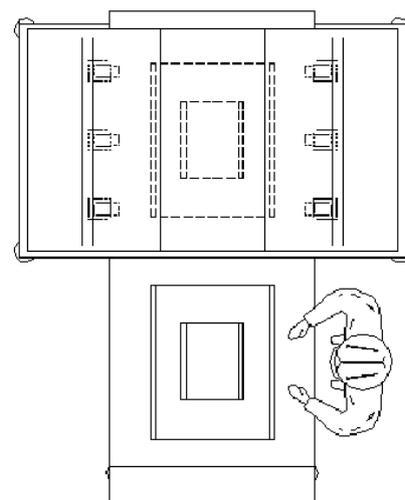
- 1: the first book preparation
- 2: the first bonding action
- 3: 1 and 2 are repeated for the second book.

The bonding is on masked-time for higher throughput

The new machine is fully automatic and no parameter setting is required.

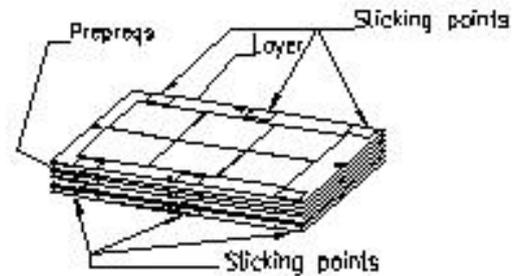
In case of "par setting" operating mode, the setting procedure includes the selection of :

- 1: the bonding times
- 2: the bonding electrical powers



BOOK PREPARATION:

1. The operator lifts the template cover when it is out of the bonding area.
2. He holds the first core on the template by using the pins for precise positioning.
3. The operator puts the pre-preg sheets and the second core on the template as for the first one.
4. The operator repeats step no.3 until the book is completed.
5. The operator closes the template cover, so allowing the shuttle to move to the bonding area automatically.



STICKING CONCEPT

STICKING ACTION:

1. The first template, once arrived in the bonding area, activates a micro-switch for cycle starting; in the meantime, the second template is available for the build-up of the second book.
2. The 4 or 6 pairs of pliers clamp the first book applying a light pressure and a uniform heating.
3. At the end of cycle, the grippers open and the shuttle with the first template moves back automatically.
4. The operator opens the template cover, and the template lifts automatically for book expelling.
5. After having removed the bonded book, the template is ready for a new book laying up.

The distances between two welders, lengthways, are adjustable by moving the arms on which the pliers are held on.

TECHNICAL CHARACTERISTICS

• Layer size:	W 305 ÷ 610 mm; L 381 ÷ 762 mm
	W 12" -- 24" L 15" – 30"
• Height of working table:	1000 mm (39")
• Power Supply:	V=400 V/50-60 Hz, 3Ph+GND, 2KVA
• Compressed air:	Pressure = 6 bar
	Consumption = 20 NL / min
• Dimensions:	L 2440; W 1900; H 1370 (mm)
	L 96"; W 75"; H 54"
• Net weight of the machine:	1100 Kg (2428 lb)
• Pliers parameters:	Maximum temperature: 350°C* (662°F)
	Typical bonding time: 25 ÷ 35s*
	Maximum clamping pressure: 4 bar
	Bonding Area: 1,8 to 2,5 sq-cm; 0,3 to 0,4 sq inch
<i>*Temperature and time are mainly depending on layers and pre-preg characteristics.</i>	

BASE MACHINE COMPOSITION :

The base machine includes:

- 1) Registration Bonding Machine mod. **RBM HP**
- 2) Four bonding heads
- 3) A couple of templates matching most of panel sizes: customer must specify the real core sizes for special requests.

Additional bonding points (S5 Option):

An additional couple of bonding heads is available on request thus reaching the 3+3 bonding areas maximum.

PANEL LAYOUT:

