

# VacuNest

**S**hape **M**emory **T**ooling

*shaping the future ~ today*

VacuNest is a NOVATEC technology

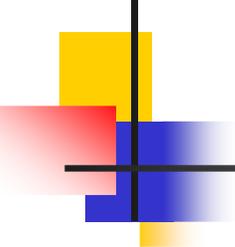


# VacuNest



*shaping the future ~ today*

Shape  
Memory  
Tooling



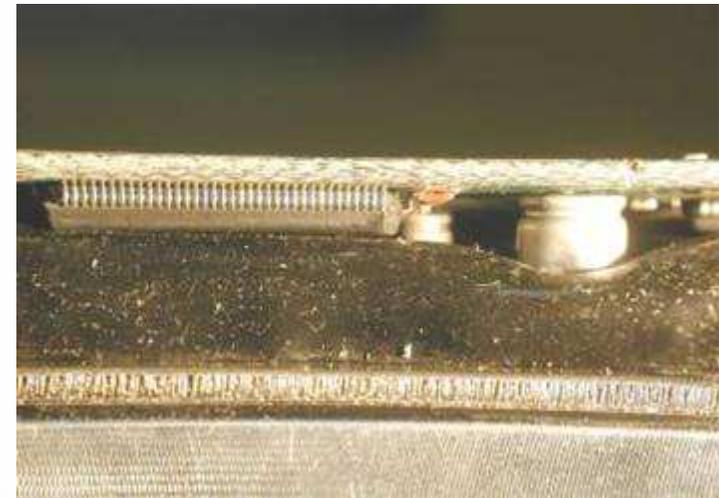
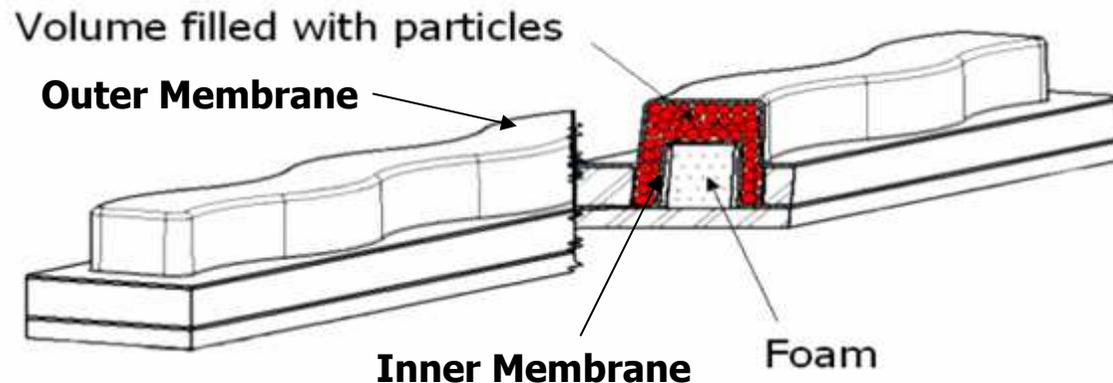
# PRIOR ART SOLUTIONS

TECHNOLOGIES	DEDICATED TOOLS	FLEXIBLE PIN ARRANGEMENT TOOLS	COMPLIANT TOOLS
<b>DRAWBACKS</b>	<ul style="list-style-type: none"> <li>- Not flexible</li> <li>- Lead-time</li> <li>- Price</li> <li>- Problem with high density boards</li> <li>- Version changes</li> </ul>	<ul style="list-style-type: none"> <li>- The support force is applied locally (components can be damaged under the joint action of the pins and the squeegee/transfer head.</li> <li>- Sensitive to solder paste contamination</li> <li>- Board flatness is not guaranteed</li> </ul>	<ul style="list-style-type: none"> <li>- The support is not firm enough</li> <li>- The boards can be bowed upwards</li> <li>- Maximum component height (5 mm)</li> </ul>

**VacuNest** - *shaping the future ~ today*

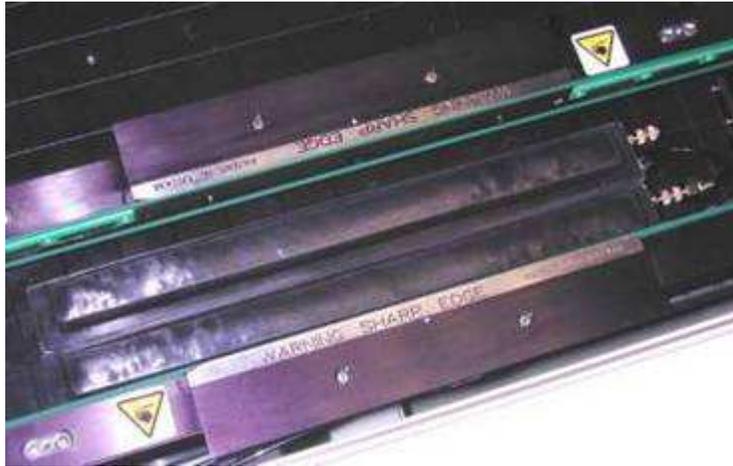
## WORKING PRINCIPLE ~ VacuNest

A pliable antistatic chamber contains a foam former surrounded by polymer granules. Simply place a golden board onto the modules and press down. The chambers are profiled to the shape of the underside of the board, on activation of the vacuum this shape is now held. The shape will be held for weeks / days / months until the vacuum is released whereupon the modules return to their original shape awaiting a new set up.

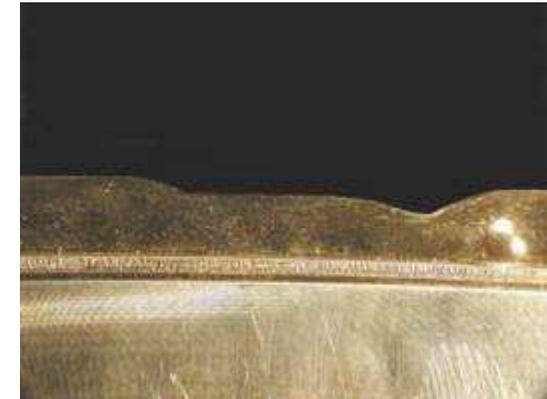
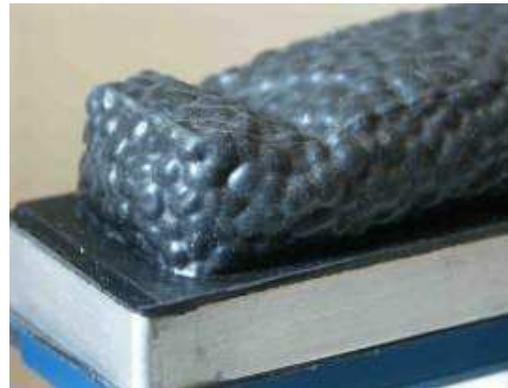
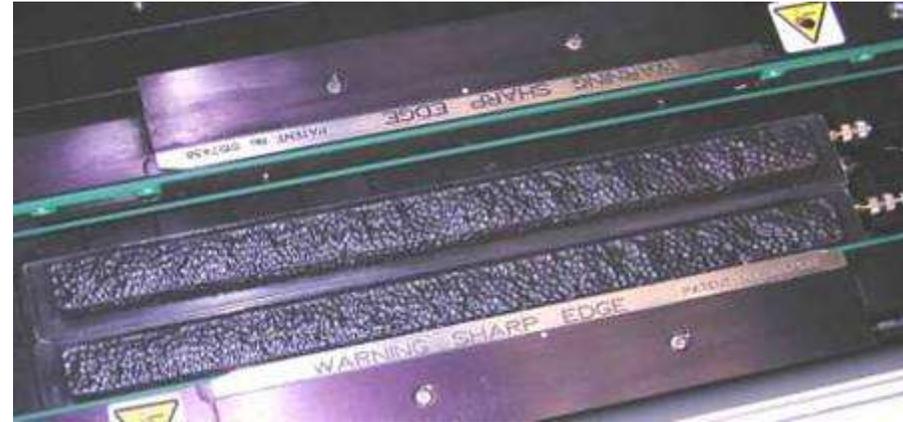


# WORKING PRINCIPLE ~ VacuNest

Pre Shaping

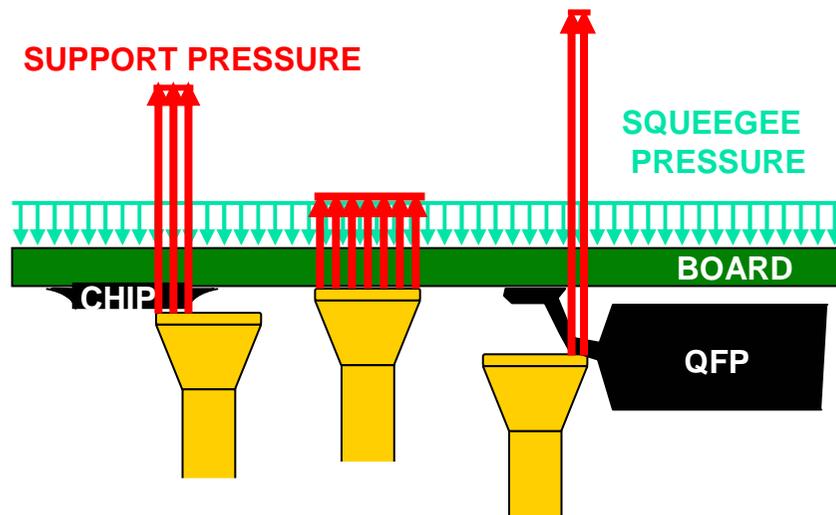


Shape Held by Vacuum

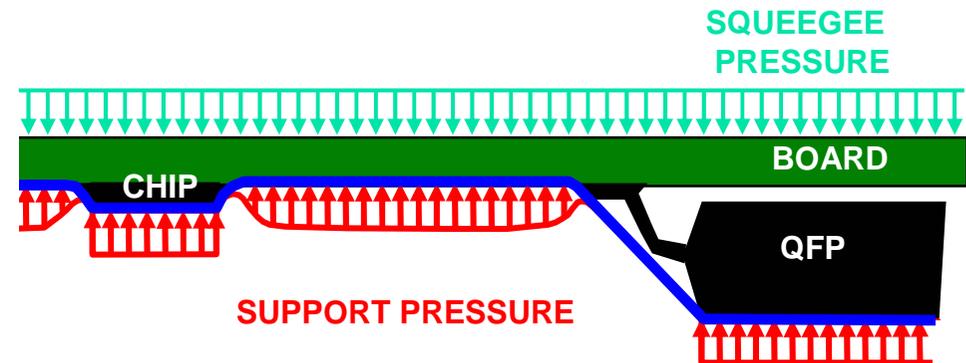


# ADVANTAGES

## Forces Prior Art



## VacuNest



### VacuNest ADVANTAGES

- The support forces are spread over the whole board
- No risk damage to a component due to the pin / printing pressure
- Firm and precise support
- Ease of use
- If a board version changes simply reset
- No dedicated tooling and very short payback period

# Modules Available



## Module Sizes

**100mm long x 40mm wide**

**366mm long x 40mm wide**

**466mm long x 40mm Wide**

**470mm long x 50mm wide**

## Low Profile

**For 25mm+ tooling height**



## Standard

**Vacuum set with tooling plate**



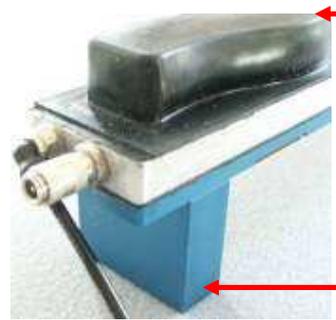
## Deflate

**Auto set up**

**Vacuum connections to inner & outer chambers**



# LOW PROFILE & STANDARD MODULES SET UP PROCEDURE ~ Step 1



Min 39mm  
Max 159mm



Quick release  
Vacuum links

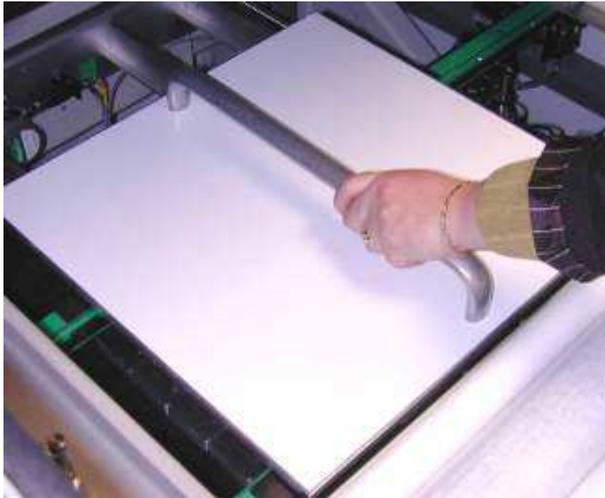


Low Profile

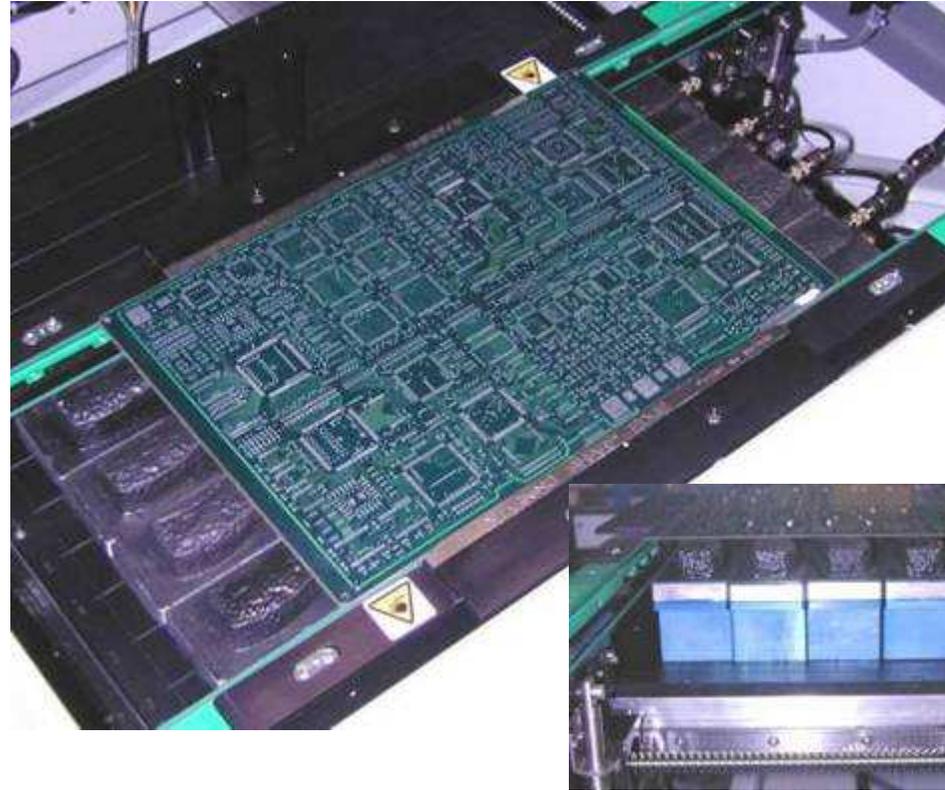
**Min 25.4mm ~ 39mm tooling height**

- ❖ Position required number of modules  
~ to suit board width ~

# LOW PROFILE & STANDARD MODULES SET UP PROCEDURE ~ Step 2



Set up tooling plate



- ❖ With board at print position, place tooling plate on conveyor rails, press down and switch vacuum "ON" ~ modules hold board profile

# LOW PROFILE & STANDARD MODULE SET UP PROCEDURE ~ Step 3

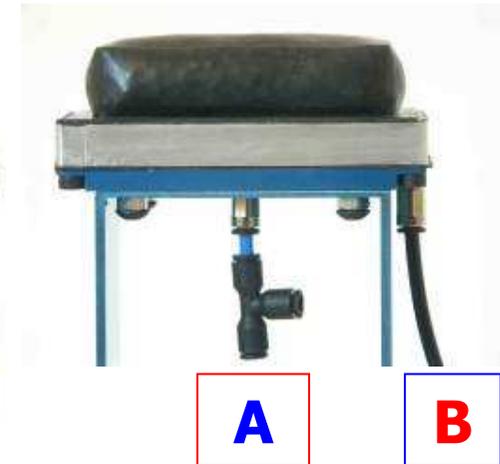
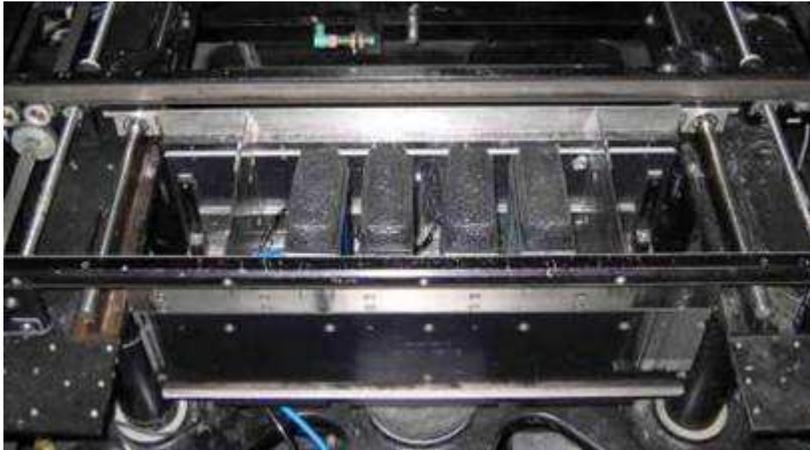


## ❖ Run Production

Provided vacuum is held (auto regulated) the shape will be held indefinitely

# DEFLATE MODULES

## SET UP PROCEDURE ~ STEP 1



❖ Position required number of modules

~ to suit board size ~

**100mm long x 40mm wide**

**366mm long x 40mm wide**

**466mm long x 40mm wide**

**470mm long x 50mm wide**

**Connect Vacuum**

~ Link the Modules ~

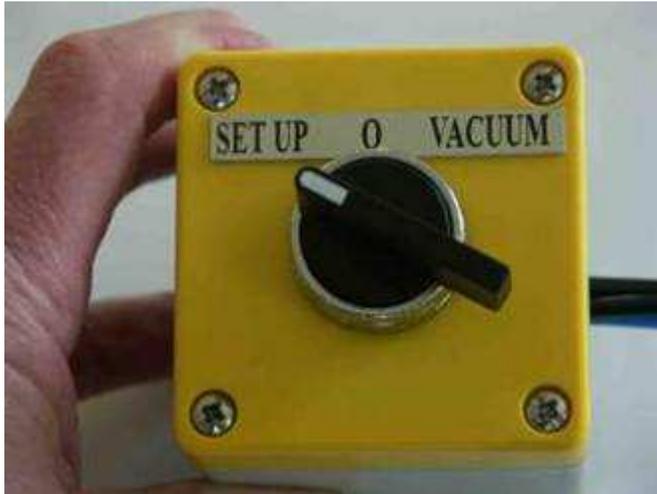
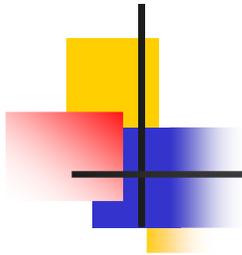
**A**

> Inner Membrane

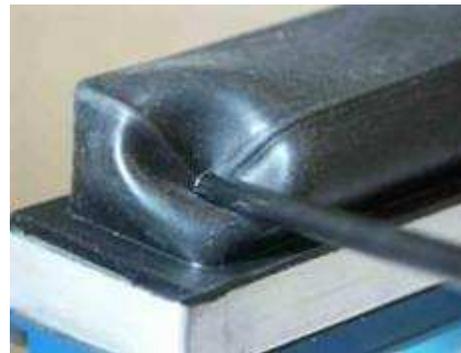
**B**

> Outer Membrane

# DEFLATE MODULES SET UP PROCEDURE ~ STEP 2



- ❖ Select ~ SET UP
- ❖ Load PCB Board

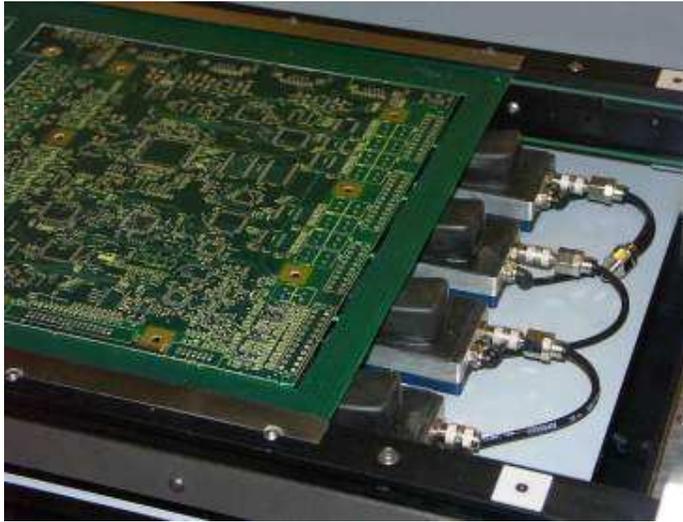


**Vacuum applied to inner  
membrane and modules**

**~ DEFLATE ~**

# DEFLATE MODULES

## SET UP PROCEDURE ~ STEP 3



+



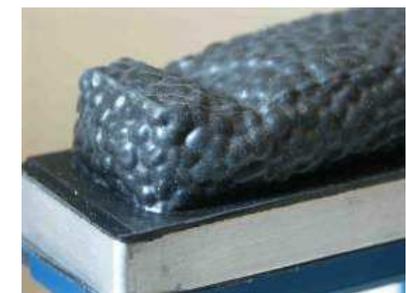
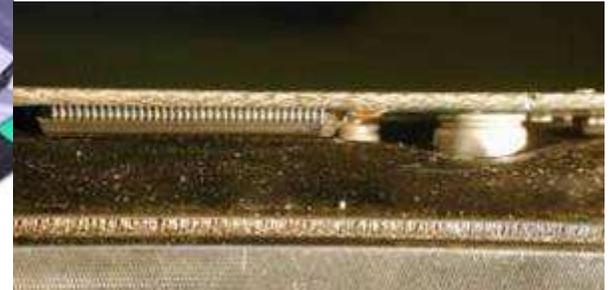
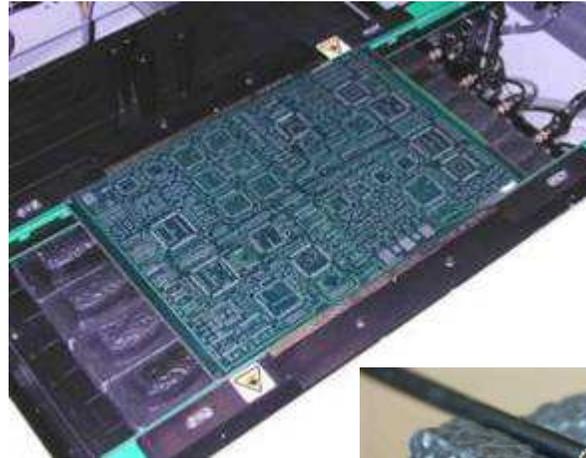
- ❖ Activate ~ rising table
- ❖ Modules contact underside of PCB
- ❖ Select ~ "0" position  
( stencil should hold board flat)  
( or use a "Set up Plate")



**Modules return  
to rest position  
conforming to  
underside shape**

# DEFLATE MODULES

## SET UP PROCEDURE ~ STEP 4



- ❖ Select ~ VACUUM
- ❖ Run Production

**Underside profile is held**

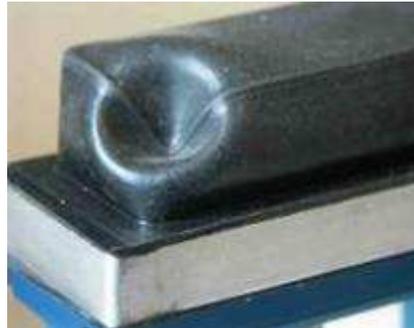
Provided vacuum is held (auto regulated) the shape will be held indefinitely

# DEFLATE MODULES SET UP PROCEDURE



Step 1

**Module at rest**



Step 2

**DEFLATE**



Step 3

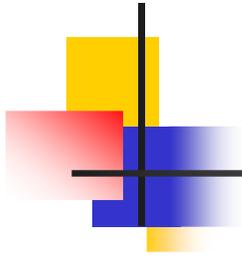
**Conform to shape**



Step 4

**Vacuum  
Shape Memory**

# VacuNest ~ Parts List Modules



VacuNest Modules (VNM) Low Profile (LP) Standard (S) Deflate (DM)

**Low Profile** : VNM – LP – (Support Length) – (Support Width) – (Tooling Height)

VNM – LP – 100 – 40 – (TH)

VNM – LP – 366 – 40 – (TH)

VNM – LP – 466 – 40 – (TH)

(TH) Tooling height 25.4 ~ 39mm

Maximum Underside Component 8mm

**Standard** : VNM – S – (Support Length) – (Support Width) – (Tooling Height)

VNM – S – 100 – 40 – (TH)

VNM – S – 366 – 40 – (TH)

VNM – S – 466 – 40 – (TH)

VNM – S – 470 – 50 – (TH)

(TH) Tooling height 39 ~ 159mm

Maximum Underside Component 12mm

Maximum Individual component 15mm

**Deflate** : VNM – DM – (Support Length) – (Support Width) – (Tooling Height)

VNM – DM – 100 – 40 – (TH) [min 55mm]

VNM – DM – 366 – 40 – (TH) [min 39mm]

VNM – DM – 466 – 40 – (TH) [min 39mm]

VNM – DM – 470 – 50 – (TH) [min 39mm]

Deflate clearance on set up 8mm

Maximum Underside Component 12mm

Maximum Individual Component 15mm

# VacuNest ~ Parts List

## Controllers

### Controllers for Low Profile / Standard Modules



**VNC – V – FS - R**

Vacuum ON / OFF Foot switch  
Connect to compressed air supply  
In built vacuum generation ~ regulated



**VNC – V – RS -R**

Vacuum ON / OFF Remote switch  
Connect to compressed air supply  
In built vacuum generation ~ regulated

### Controller for Deflate Modules



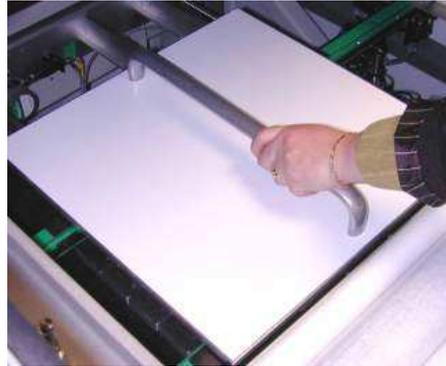
**VNC – V – RS – DMV - R**

3 position Remote switch (SET/ 0 / VAC)  
Connect to compressed air supply  
In built vacuum generation ~ regulated

# VacuNest ~ Parts List

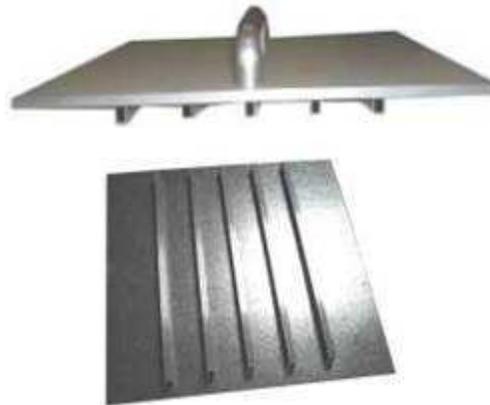
## Set Up Plates

### VNSP - 450



Set up plate 450mm x 450mm with lifting handle, to ensure board is flat. For use on Printers or machines with "flush" over the top Board tooling clamps.

### VNSP - 450 - R

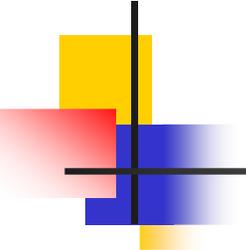


Set up plate 450mm x 450mm with lifting Handle. Complete with a set (5 pieces) of tubular strips that incorporate magnetic strips For attachment. Strips positioned between conveyor rails to flatten board where over the top tooling clamps are not flush with board surfaces ~ typically on pick & place machines.

### **VacuNest Module Membrane Repair**

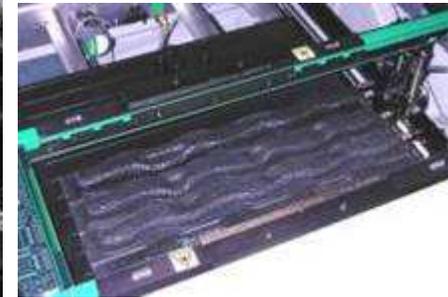
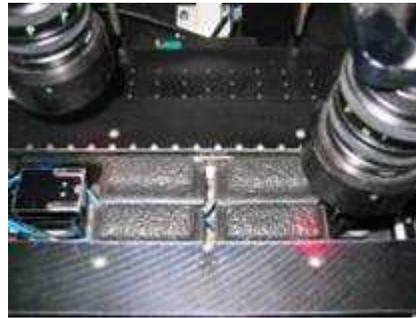
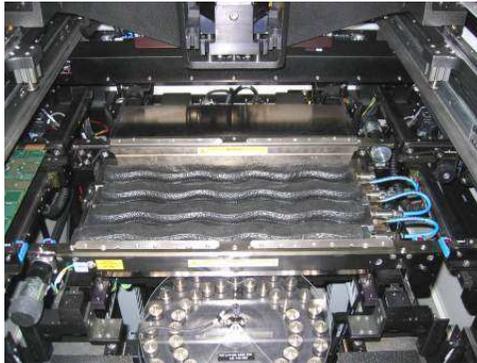
Service Exchange / Recovery Service: In the event of a membrane being damaged

Novatec offer a return to factory refurbishment service



# *Shaping the future today.....*

## *Screen / Stencil Printers*



## *Placement Machinery*



# VacuNest

# Shape Memory Tooling