

PRE-PREG OVEN COOKING YOUR VACUUM LINES?

Cost effective composite oven vacuum solutions

We are often asked "where can we buy high temperature vacuum rated hose that can withstand temperatures up to 200°C?". Up until recently we could only recommend supply of small bore autoclave hose which is expensive and restrictive to flow for typical Kiwi vacuum systems. A better solution was about to become apparent...

We had been investigating a moderate cost flexible vacuum tube for our Vacmobile 20/2 infusion system and had tested hoses from Australia, Greece and Germany.

None of the industry standard hoses offered the right mix of flexibility and seal integrity so we decided to assemble and test our own large-bore vacuum hose using a special silicone hose with internal reinforcing spring.

A matching fitting system was developed allowing straight forward connection to 1/2" or 3/4" hose sizes.

VABS met with Richard Paki from Black Magic Composites in Kumeu, who design and manufactures superlative composite components and deck hardware for super yachts. BMC required a number of high temperature flexible vacuum lines for their newly commissioned pre-preg oven. They had experienced problems in the past when using low cost wire reinforced PVC hoses, which failed at high temperature.

With a custom 'through oven' fitting from VABS the new hose was put to test immediately. One week and several high-temp cooks later, the hose passed with flying colours. The generous 3/4" bore allowed direct leak-free connection to the standard connections on Black Magic's Vacmobile 30 mobile system, which reduced bag evacuation time and allowed quick air release when making bag adjustments.

BMC were impressed with the performance of the new hose and have since installed four sets of hoses and bag fittings to their oven as pictured below.

Please contact Derek at VABS with any oven vacuum application queries.



Photo courtesy of Black Magic Composite Group, web site; www.blackmagicgroup.com

In our next issue

RTM vacuum solution put to the test

New resin trap design with quick release lid and 3" sight glass

Large Vacmobile for leading mast and spar manufacturer

Vacmobile featured products at IBEX 2006 (Miami 1-3 November)



Working height 1m Transport height 0.6m

The 'Infusion 20/2' – 20 m³/h of vacuum pump capacity with integral 2 litre resin trap. Compact and convenient vacuum system for jobs up to the size of a 6 m boat hull.



VABS range of purpose built resin traps, hose connectors, infusion hose, gauges, and bag fittings.



Vacuum Pumps from 4 m³/hr to 1000 m³/hr

IBEX composites show October-November 2006

For the latest information on composite materials and manufacturing processes visit the IBEX show in Miami 31 October to 3 November 2006. Especially for BoatBuilders, IBEX is the only event in the world where the most advanced products and education are available. Register by October 10, 2006 to receive your FREE exhibit-hall badges in the mail.

The international BoatBuilders' Exhibition & Conference 2006, Miami, Florida with pre-conference seminars on 31 October.

Email: info@ibexshow.com

Web: <http://www.ibexshow.com>

VABS will be exhibiting our latest Vacmobile systems and resin traps at IBEX. Visit our booth 2445!

Vacmobile® better vacuum systems for better composites



Vacmobile 'VB' series
High capacity single and three phase powered vacuum bagging systems



The 'Quick-draw'
Revolutionary patented design, capacities up to 120m³/hr **single phase!**



Vacuum leak detectors and digital absolute vacuum gauges

www.vacmobiles.com

Not all resin traps were created equal...

Vacmobile resin traps are specifically assembled for composites use, with large-bore vacuum outlet fittings. They are available with 1-4 vacuum outlets and use a fitting system that seals on the outside of vacuum tube, preventing resin build up in joints.

Other standard features include regulated air admit port (for slow vacuum release), swivel vacuum indicator gauge and side-port vacuum pump connection.



Making your own resin trap?

DO

Use large bore connections to the trap to ensure good evacuation flow rates from pump to part

Use a fitting system that seals on the outside of the vacuum hose, thereby removing the need to drill out or discard fittings after each use

DON'T

Use fittings with restrictive bore sizes (less than 9.5mm) unless you are only working with small parts

Pull out a hose or use a large valve to vent the resin trap to atmosphere when the trap is under vacuum, as any trapped resin will splatter onto the trap walls and lid

How do I regulate the vacuum level on my lay-up?

Regulating your vacuum level to control your bag evacuation doesn't need to be a frustrating hit or miss affair. Initial bag pull-down on parts with complex geometry requires a gentle evacuation to avoid bridging, especially when using vacuum bag materials that don't have great elasticity. You may also want to

control the vacuum level when using polyester or vinyl ester resins, or when bagging a delicate core material.

Admitting air into the vacuum system is the common way of controlling the bag pressure and evacuation rate.

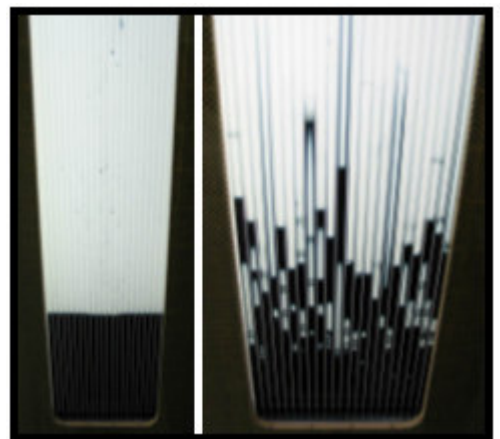
One way to reduce the bag vacuum is to bleed in atmospheric air, either by opening a vacuum manifold valve or unplugging a vacuum line. Whilst effective if you want to bring the bag back to atmosphere in a hurry, it doesn't offer an easy measure of vacuum control. A better method is to install a spring controlled vacuum regulation valve in the vacuum line or at the pump manifold. This will allow the operator to dial-in the required vacuum level quickly.

Vacuum regulation valves are inexpensive, easy to install and provide repeatable results.

Water and vacuum

Water can accumulate inside a vacuum pump oil sump causing reliability problems and increased maintenance costs as explained in our January composites newsletter.

What you may not realise is that the source of this water is moisture absorbed in the laminate during storage. Even at ambient temperatures, the trapped moisture boils off at vacuums better than 40 mbar. While some passes straight through the pump as vapour, the remainder condenses in the vacuum pump oil.



Above left – dyed water in capillary tubes depicting a standard laminate. Right – the same column subjected to full vacuum at ambient temperature, noting the vigorous boiling taking place.

Vacmobile® better vacuum systems for better composites

Water and vacuum cont...

Pre-preg and post-cure ovens can elevate the amount of vapour in the vacuum system and it's possible for pools to form in the vacuum lines after a cook. These are ingested into the pump as liquid slugs when the pump is started. Large amounts of water in the vacuum pump oil leads to corrosion, blocked oil mist filters and electric motor starting problems.

A typical water trap/filter is shown below, suitable for pumps up to 200 m³/hr in size.



Cost effective CNC routers for the composites industry

Waka New Zealand Ltd is meeting the CNC programming and flatbed router supply needs of a growing list of clients throughout the country in a diverse range of applications, most requiring a vacuum pump for hold-down.

Techno (USA) produce cost-effective 3-axis models from small tabletop machines right through to 5 x 2 metre flatbeds with up to 475 mm of gantry clearance, and have a 5-axis machine under development which is expected to cost significantly less than anything seen on the market before.

The Techno vacuum table surface and system provides great flexibility in use, and is effective for a complete vacuum table for panel work or for holding small parts in precise and repeatable locations on the table in engineering applications.

Waka also represents ART (Advanced Robotic Technology), Australian-based market leaders in the cutting of aluminium plate with machine beds up to 20 x 2.5 metres. Additionally, Waka provide a problem-solving and jobbing service from their Christchurch base on a 1.2 x 2.4 metre Techno router, cutting profiles and shaping moulds for a select client base which includes Air New Zealand, Syft Ltd and several specialist composite manufacturers.

The website gallery (www.waka.co.nz) shows the diverse capabilities of this high-speed machinery, with links to their partners and suppliers.



Phone: 03 322 1050

Email: sales@waka.co.nz



Above, CNC technician Roger Farmer prepares to connect a new VABS supplied PVR 300 m³/hr 5.5kW vacuum pump to the Techno LC+4896 at Waka.

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Thru-bag fittings

Looking for a high-flow leak tight fitting to penetrate your bag, or sick of cleaning resin from between joints? We were and decided to make our own thru-bag fitting based around popular 1/2" OD polyethylene infusion hose.

The fitting uses an o-ring sealed gland nut to provide a leak tight vacuum seal around the tube, which runs right through to the very inner edge of the base.

We also offer adapters to suit hose sizes up to 3/4" in bore size, so let us know if you would like to try a sample.



Resin infusion consumables costing an arm and a leg?

Spiral tie is a popular media for feeding resin into a lay-up. It is a single use consumable item and typically sourced through an electrical outlet shop or wholesaler.

There are different grades of spiral tie available. The thin-walled 1 mm section spiral tie will flatten under vacuum which restricts the flow of resin. 1.5 to 2 mm walled tie is most suitable for infusion use.

VABS can now supply bulk and individual spiral tie rolls suitable for resin feed lines at around half the cost of historical prices.

We have been supplying translucent polyethylene tubing for in-bag vacuum lines and trap connections for some time. This tubing is available in two sizes, 1/2" OD and 5/8" OD (for resin feed line use)

For more information and prices, please phone or email us at:

consumables@vabs.co.nz



New web site – www.vacmobiles.com

Vacmobiles.com
Better vacuum systems for better composites

Hassle-free vacuum systems for composite manufacturers wanting to reduce costs and improve quality

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Your composite part here

Industries benefiting from Vacmobiles include

- Aerospace
- Automotive (cars, trucks, motorcycles)
- Boatbuilding
- Trains
- Containment (tanks, pipes, cryogenic vessels)
- Furniture (high-end and outdoor)
- Building (storm resistant shelters, lightweight claddings)
- Sporting goods (surfboards, protective helmets)
- Model making (movie sets, hobbies)
- Light/stiff mechanical components (robot arms, cranes)
- Electronic components

Vacmobile™ model infusion 20/2

VABS in overview ...

VABS stands for Vacuum & Blowing Solutions. We specialize in the design and manufacture of high quality vacuum systems for the composites industry.

In New Zealand we also provide additional products and services as listed to the right.

Please call for further information.

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- A comprehensive range of quality vacuum pumps and low pressure blowers for industrial and research applications
- Spare parts for most makes of vacuum pumps
- Vacuum gauges, vacuum leak detectors, vacuum tight gland fittings and hose consumables for composites use

- One-off vacuum systems and installations – especially for composites related applications
- Vacuum problem solving
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- Vacuum courses
- On site assessment and servicing
- Just good old helpful advice!

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