THE COMPOSITES LETTER

Issue #10, 2009

THE MARTIN JETPACK & DYNAMIC COMPOSITES LTD — FLYING HIGH WITH HELP FROM VACMOBILE

Dynamic Composites is a Christchurch (New Zealand) based composites design and specialist manufacturing company with a focus on creating innovative solutions.

Established in 1997, they have successfully married passion, innovation and engineering excellence to break world records and develop leading technology, products and equipment.

The companies main ambition has been a commitment to produce unique solutions that demonstrate outright performance, improvement and inventiveness, whilst maintaining a functional and technical focus.

The skills, expertise and determination of the company have been in demand over a broad range of areas such as aerospace projects, undertaking "special projects" for America's Cup syndicates and working with elite sportspeople and the New Zealand Academy of Sport.

Dynamic Composites were approached in 2004 by the Martin Aircraft Company to help fulfil the dream of personal flight.

Earlier Jetpack prototypes, although functional, were too heavy requiring the development of the complex composite components of the new ground breaking Martin Jetpack.

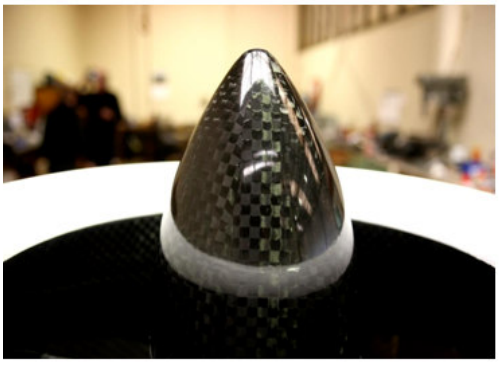
The Martin Jetpack, developed over 27 years, is set to become the world's first commercially viable, ultralight personal jetpack. Development of jetpack design, dating back to the1950's, has been continually hampered by the problem of sustained flying time.

Early Jetpacks could only stay in the air for less than 30 seconds. The Martin Jetpack is being developed to fly for 100 times longer. It sounds like science fiction – but this unique machine is very real.

One of the critical factors in developing the Martin Jetpack was weight saving. Using the latest composite technologies, Dynamic Composites has created a carbon fibre composite airframe that weighs less than 30% of the machines' total dry weight – yet is rigid and strong enough to meet the demands of flight.

Dynamic Composites also designed carbon fibre components for the unique Martin V4 engine including high temperature carbon fibre engine head covers and air boxes.

Vacmobiles.com recently supplied a 20/2 infusion machine to Dynamic Composites. This was used to produce some of the clear carbon finished parts of the third P11 Martin Jetpack, including the tailcones and rear shrouds as pictured below.



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LIGHTWEIGHT RACING YACHT LIFE RAFT CASES BY HAKES MARINE

Situated 50m from Seaview Marina and located within the busy Marine Industrial area of Wellington (New Zealand), Hakes Marine has been purposely set up for the production of composite racing yachts. The shed offers 1200sqm of factory floor space and offices to cater for running the company and project management. The shed also boasts a very steep and high pitched roof which enables both heavy lifts and good ground clearance for rolling entire yachts and keel fits inside. Hakes Marine also has a boat trailer which works in conjunction with Seaview Marina to bring boats into and out of the shed.

The facility has a 70ft oven for large component cooks (like hull shells) and also has the ability to be compartmentalized for small component post curing. The oven is capable of curing components at over 90 °C and is powered by an 186kW furnace. When a more efficient laminating system other than a high temperature prepreg is called for, Hakes Marine has a state of the art 'wet out machine' for accurate saturation of dry reinforcements with liquid epoxy resins. A real time quality control system is used in conjunction with the wet out machine to ensure that a strict weight control of the laminate is maintained. Air supply for two-pot epoxy priming and urethane painting is passed through a condenser and filter system to remove moisture and contaminates for the perfect paint job.

While known for their race yachts, Hakes Marine also manufacture high performance composite products like these life raft cases that are built for RFD New Zealand (marine and aerospace survival systems). Produced using Vacmobile vacuum systems, they are infused carbon and weigh less than 1kg. They replace the standard white gelcoated GRP cases that weigh over 3kg. A must for any racing yacht carrying a life raft where every kg counts.

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CNC ROUTING CAPABILITY, WAKA NEW ZEALAND & 3 DESIGN

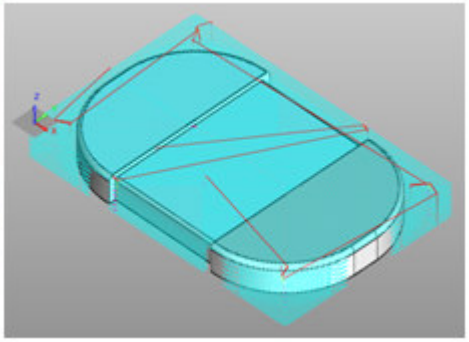
Vacmobiles.com Ltd recently installed a Techno 48"x96" CNC router for prototyping and plug/mold work which was supplied from Christchurch based Waka New Zealand.

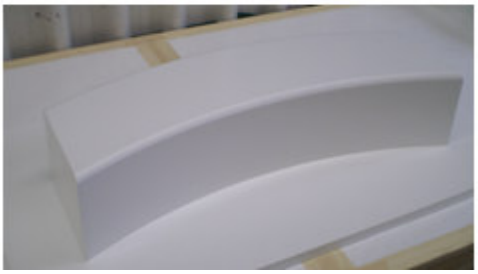
Waka supplies machines in sizes that range from small tabletop engravers to mammoth 21 x 3m plate cutting routers and plasma cutters.

Waka is the partner of Techno (USA) CNC routers, ART (Australia) CNC routers, plasma cutters and also distribute VisualMill and RhinoCAM software.

When trying to find the right machine, software and support package, manager James Dowle, emphasizes decision-making, cost-effectiveness, support and training to maximise machine utilisation.

Helping with the operation of the new CNC machine at the Vacmobiles.com campus is design company, 3 Design, headed by Derek Goldfinch. Using Solidworks 2009 Derek can assist with modeling of plugs and molds, engineering draughting and product development.





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Vacmobiles.com™
Better vacuum systems for better composites

SMALL RUN PRODUCTION INFUSION SPECIALIST

Queenstown Firebglass is a small composites specialist manufacturing and repair shop based in the South Island of New Zealand. The business is owned and managed by Robert Mataric, who has a flare for design and isn't afraid of trying something new.

Vacmobiles.com supplied Robert with one of the very first Vacmobile 20/2 machines and assisted with some resin infusion training in 2005. His first project was to develop the infusion process for a number of custom carbon fibre skydiving helmets. Achieving a perfect aesthetic finish was crucial for his customers and the advantage of using the vacuum assisted infusion process is that voids and pinholes in the laminate are eliminated.

Since mastering the helmets, Queenstown Fibreglass has been successfully infusing a variety of components.

Shown below left, one side of a 1.9m square two piece hard top made for Lazer craft and Southern boats. Both sides infused with Vinylester resin with an approximate weight of 30-32 kg. Robert aims to produce about one hard top per week in the near future.

Over the course of 12 months, Robert also recently completed the design and build of the mold for an extremely sexy utility canopy to suit the new Mitsubishi Triton ute.

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Better vacuum systems for better composites

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WIND BLADE MANUFACTURER EXPANDS OPERATIONS IN 2008

Wind Blades Limited, based in Auckland (NZ) manufacture wind turbine rotor blades up to 16m in length made from wood/epoxy or foam/FRP/GRP. Each assembled wind turbine, with an annual mean wind speed of 8.5 m/s (30 km/h) can power the equivalent of 200 households.

They have been producing blades from 2003 and recently relocated to a larger facility in East Tamaki. In 2008 blade production has increased from one blade every four days to one blade every three days. Build time will further improve to one blade every two days during 2009.

Wind Blades have three Vacmobile vacuum systems, which are used for vacuum bagging the blade laminate and resin infused construction of the blade web.

Two of the systems were customised to fit underneath blade molds while retaining the standard gland tubing connection systems which simplifies connection of vacuum tubing.

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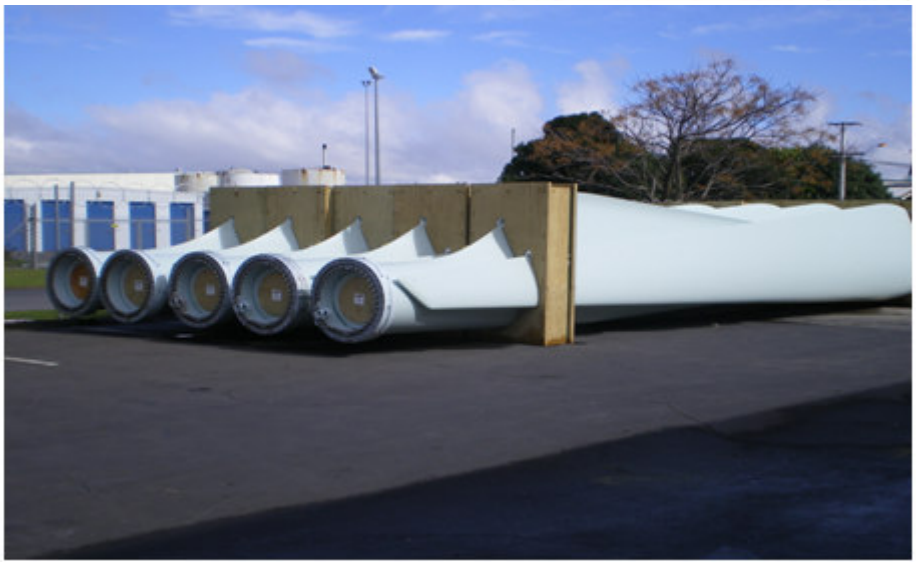
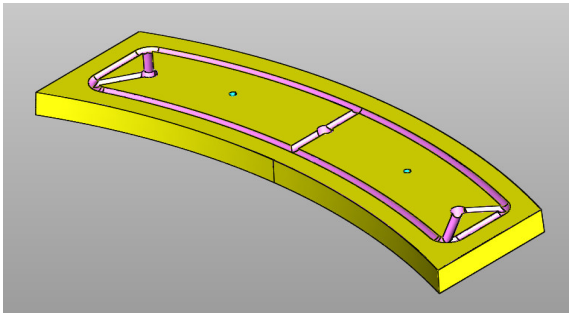


INFUSING MDF PLUGS & MOLDS

For those infusing MDF plugs or molds, you have most likely found that large amounts of water can condense in the vacuum lines and vacuum pump when post curing. We assisted one of our customers to overcome this problem by designing a series of vent galleries that allowed trapped water vapour to be vented to atmosphere while the mold surface is presented to full vacuum. We will write more about infused MDF molds in the next issue.



RESIN BUCKET HOLDER

We have designed an inexpensive but useful resin bucket holder to suit two standard 10 litre plastic buckets. The kit includes bottom mounted tank fittings with control valves (as shown below). The good news is that we have free samples to give away to the first 3 respondents.

Please contact brendan@vacmobiles.com for further information regarding the mold gallery system or bucket holder.

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