

Composites Industry Apprentices

Become One

Everything you need to know about
training in the New Zealand
Composites Industry



www.NZMACITO.org.nz

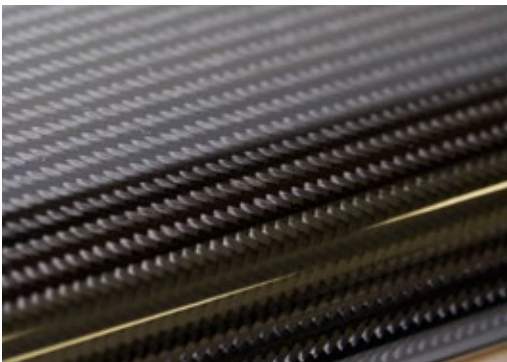


COMPOSITES
ASSOCIATION
OF NEW ZEALAND

Composites

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(NZ Marine ITO, previously Boating Industry Organisation) a division of NZ Marine

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Who We Are | 02

What we do

We provide leadership in the development of skills and training excellence to the marine and composites industries.

What we do as an Industry Training Organisation

Industry Training Organisations carry out the following statutory functions under the Industry Training Act (1992):

- Set national skill standards for their industries
- Arrange for the delivery of on and off-job training
- Arrange for the assessment of apprentices
- Provide information and advice to apprentices and their employers
- Provide leadership within the industry on matters relating to skill and training needs

Who does what?

The NZ Marine and Composites ITO is responsible for managing the training of all Composites Industry Apprentices. When an employer wants to train an apprentice, a three-way training agreement is entered into between the employer, the new apprentice and the NZMAC ITO. On signing the training agreement, the parties agree to do the following:

The Employer:	Agrees to train the apprentice in accordance with the training requirements.
Workplace Trainer:	Guides the apprentice in workplace training and verifies their competence in specific skills.
The Apprentice:	Agrees to master the skill and knowledge requirements of the apprenticeship while training on-job and agrees to supplement this skill-development by under-going off-job training.
NZMAC ITO:	Agrees to support and provide training solutions, assessment and mentoring services to the apprentice and the employer throughout the term of the apprenticeship.

When you're done

Graduates of the NZMAC ITO are recognised as fully qualified trades-people by the New Zealand Composites Industry and the New Zealand Qualifications Authority (NZQA). In addition, thanks to the professional reputation of the New Zealand Composites Industry internationally and to the high standards of training, NZ Marine and Composites ITO graduates are highly regarded and sought after around the world.



The employer-apprentice relationship:

**It's my responsibility to teach you,
and it's your responsibility to learn.**



03 | Benefits

Benefits of the Industry Training Model:

- ▶ Training on the job with selected specialised programmes.
- ▶ Training on the job leading to a qualification NZMAC ITO supports, has many benefits.
- ▶ You are earning while you learn.
- ▶ No student loan! No long periods of time off work to train.
- ▶ You finish your training with a job.
- ▶ The job is one you have chosen.
- ▶ You gain practical skills.
- ▶ These skills are nationally recognised, show employers across New Zealand you have got what it takes.
- ▶ The skills you gain are in demand, valued and transferable to other industries.



Have a goal. Those who aim for nothing always hit it.

Support for Apprentices

After a training agreement is signed, the NZMAC ITO assigns a Field Officer to each new apprentice. NZMAC ITO Field Officers are industry qualified and experienced tradespeople.

Our Field Officers provide individual support by:

- ▶ Visiting each apprentice every 8 - 12 weeks, wherever they work in New Zealand.
- ▶ Acting as advisors, mentors, and coordinators for apprentices.
- ▶ Liaising, advising, and supporting workplace trainers and verifiers.
- ▶ Negotiating customised on-going training plan goals and objectives for training delivery and assessment.
- ▶ Negotiating off-job training solutions.
- ▶ Evaluating training progress by conducting assessments.
- ▶ All of our Field Officers have first hand experience in the industry.

About the Composites Industry

What Are Composites?

Composites are simply any material made of two or more distinct materials. The composites industry is therefore based around combining a large range of resins with a large range of reinforcement materials to make an even larger range of new products.

Why Use Composites:

Composite materials are well known for being lightweight, strong, and corrosion resistant from weather and chemicals. Composite materials can be easily moulded into complex shapes.

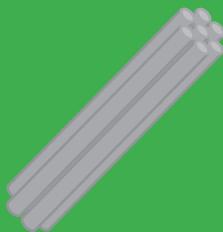
Innovations Across Industries:

Composites are used in a wide variety of industries including aerospace, architecture, automotive, energy, infrastructure, marine, military, sports and recreation. Innovators in the composites industry continue to find new applications for composite materials.



How it Works

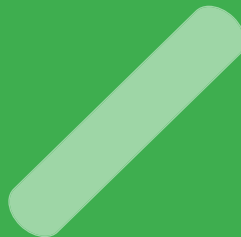
Fibre



Provides strength and stiffness (glass, carbon, aramid, basalt, natural fibres).



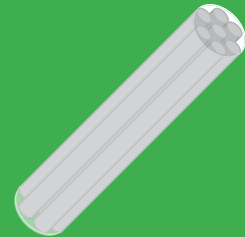
Resin



Protects and transfers load between fibres (polyester, epoxy, vinyl ester and more).



Fibre Composite Matrix



Creates a material with attributes superior to either component alone.

Consumer Composites

Consumer composites typically include products (that require a cosmetic finish) like boats, recreational vehicles, bathroom fixtures and sporting goods. In many cases, the cosmetic finish is an in-mould coating. Consumer products make up a significant portion of the composites market place.

Industrial Composites

Composites are used in industrial applications where corrosion resistance and performance (in adverse environments) are critical.

Composites are increasingly becoming the material of choice due to their high strength to weight ratio. In this segment of the industry, performance is more important than cosmetic finishes.

Industrial composite products include underground storage tanks, scrubbers, piping, fume hoods, water treatment components, and pressure vessels.

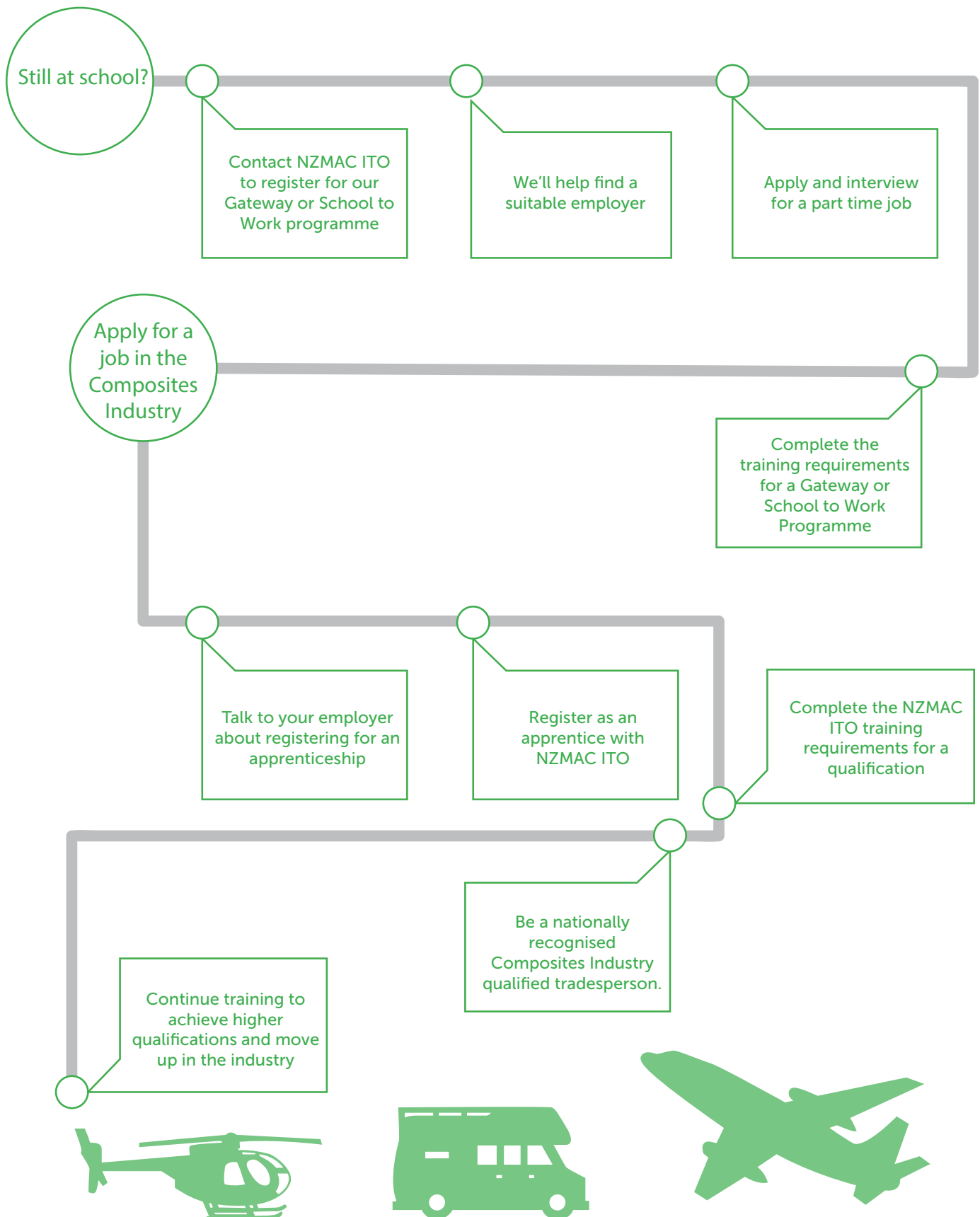
Advanced Composites

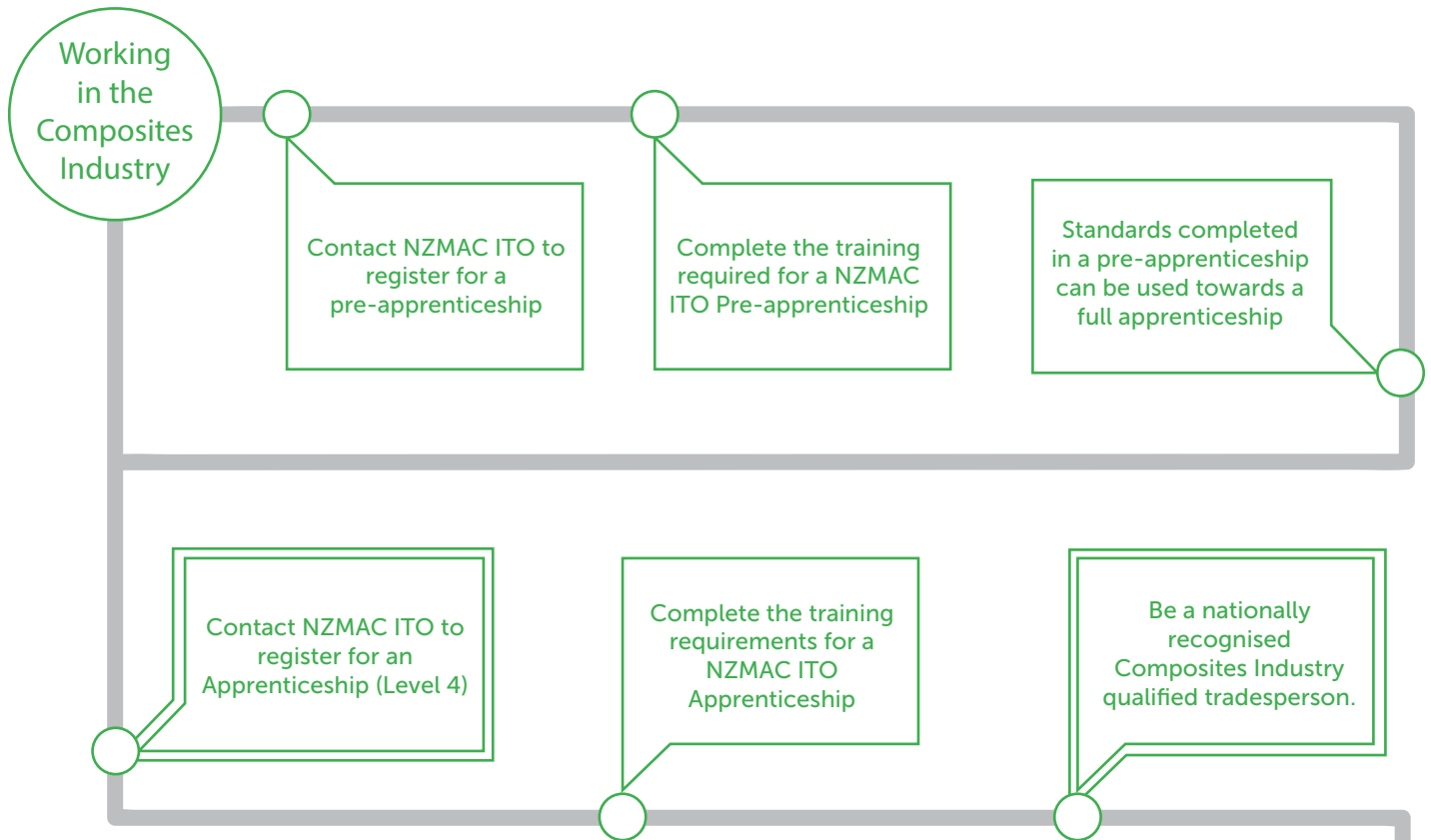
Advanced composites are generally characterised by extremely high strength fibres with high stiffness. Advanced composites are replacing metal components in many uses, particularly in the aerospace industry. Modern high-tech composites are used in the manufacture of wind turbine blades, aircraft parts, hot chemical tanks and in the automotive industry. From Formula One race cars to engine parts for family cars.

05 | Get Started

How to get started:

Whether you're still at school, or already in the workforce there's a pathway to get you into an apprenticeship. Composites Industry apprentices are highly regarded, they learn real world skills that are transferable across multiple industries.



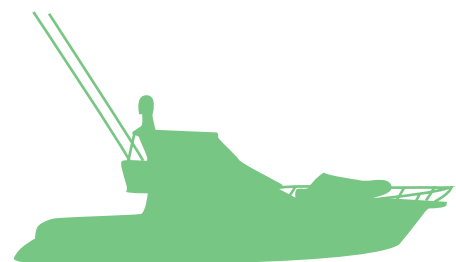
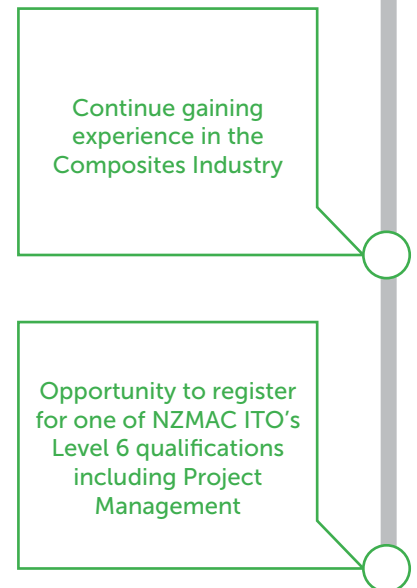


The key parts of an apprenticeship:

- ▶ Off-job training
- ▶ Online Learning
- ▶ Workplace training

No doubling up on standards:

Credits earned throughout your journey (through the Gateway Programme, School to Work Programme, or a pre-apprenticeship) can be used towards Level 4 Qualifications (Full apprenticeships).



07 | Schools

If you're still at school, we have programmes for you

The School to Work initiative is a project co-funded by the Tertiary Education Commission (TEC) and has been designed to create a career pathway for Year 12 and 13 students. This allows students to experience the marine or composites industries while still earning credits towards completion of NCEA qualifications. NZMAC ITO matches a learner with a composites employer and typically, selected students will be employed on a part-time basis (usually 2 days per week – or as agreed by the school and employer) for the duration of the school year.

Students will work towards earning unit standard credits at Level 2 or 3 that will be awarded towards NCEA Level 2 or 3 and will attend school for the remaining 3 days per week working towards NCEA credits. NZMAC ITO will develop an individualised learning plan (ILP) for each student and will assess and report credits gained in the workplace.

School to Work is designed to assist students with a genuine interest in a career in the composites industry to gain industry experience while completing Level 2 or 3 NCEA qualifications.

Sample Learning Plan

A student attending school for 4 days and on placement for 1 day per week, completing 20 days of employment, could be assessed for 10 credits.

Or

A student attending school for 3 days and on placement for 2 days per week, completing 50 days of employment, could be assessed for 30 credits.



Gateway

Gateway programmes are structured workplace learning programmes offered to senior secondary school students. NZMAC ITO Gateway programmes are focussed on giving students a taste of the Composites Industry. Programmes balance practical real-world skills and theoretical work counting towards NCEA credits.

Our programmes provide students with interesting, challenging opportunities to work in a highly regarded industry while getting a head start on industry qualifications.

In Work

NZMAC ITO's programmes

NZMAC ITO works with Industry leading experts to develop the best programmes for our apprentices. Our trainees learn skills that are relevant and in demand in the Composites Industry. For more details regarding our programmes check out our website or contact us for a programme brochure. These programmes will be available from 2017/18:

Composites Technician (Level 3, 4, 6)

Boat Building (Composite)

Spar Making

Production Boat Building (Composite)

What a Composites Technician does

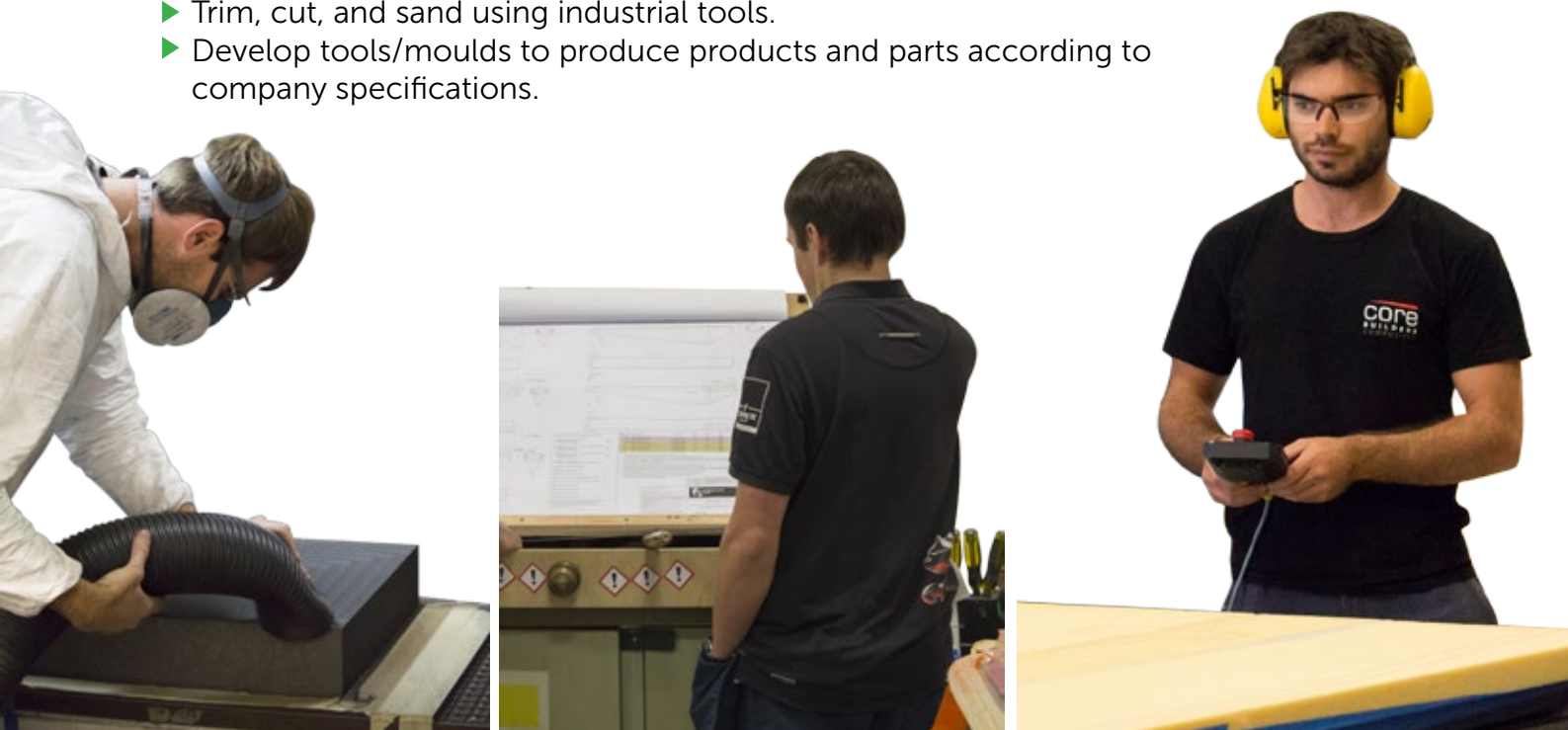
An apprenticeship through NZMAC ITO can lead to many interesting careers across the composites or marine industries. A common role is a Composites Technician. Here is a short example of what some composites technicians do on a daily basis.

Responsibilities:

- ▶ Manufacture parts using specialised equipment.
- ▶ Modify glass, carbon, and other fibres to create parts and structures according to project specifications.
- ▶ Machining.
- ▶ Explain creation and troubleshooting processes to employees.

Tasks:

- ▶ Read plans and other sketches to apply resins in specific quantities.
- ▶ Trim, cut, and sand using industrial tools.
- ▶ Develop tools/moulds to produce products and parts according to company specifications.



09 | Achievements

**Don't just take our word for it,
see what past apprentices have to say:**

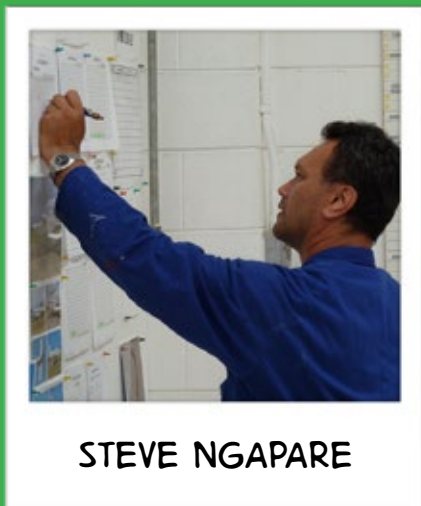
Matthew showed promise in technologies at secondary school and knew he wanted to find a practical industry job.

Matthew is currently completing his Composite Technician (Level 4) apprenticeship whilst working at Core Builders Composites and volunteering for the New Zealand Coastguard. His current work involves pre-cutting materials using an Eastman Machine, pre-pregging carbon fibre into pre-cut and labelled layers ready to stack into parts. Matthew also laminates, builds, and does some factory improvement when required.

Matthew's ideal job would be as a Cabinetmaker in superyachts, boatbuilding or machining. The best parts of Matthew's experience as an apprentice so far have been working on the Eastman Machine, working in the clean room, manufacturing hatch surrounds, and other boat parts.



'If you like a challenge and enjoy working with your hands, go for it.'
- Matthew Larsen.



Steve had many years of experience working in the boating industry before he made the transition to the composites industry.

He has worked with Markline Boats, Quest Star Marine, Formula Cruisers and Rayglass Boats. He is currently employed with Composites International Ltd where he is the shop foreman overseeing all aspects of the products produced for the aviation industry.

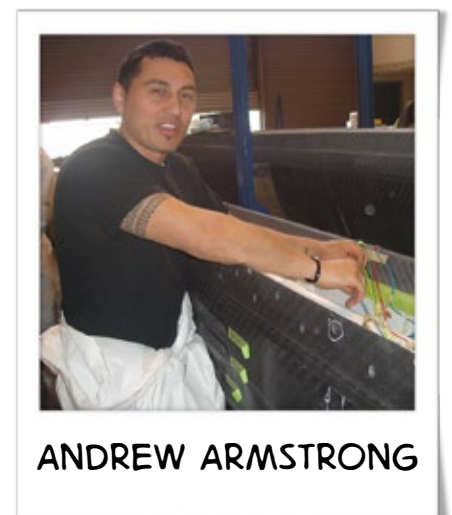
Steve graduated with Certificates in Composites (Level 3 and 4). He has also completed the Introductory Application Competitive Manufacturing (Level 2). Steve intends to take his studies forward with a Certificate in First Line Management (Level 4).

'Training has helped me keep up with today's needs in business and the composite sector' - Steve Ngapare

Andrew Armstrong completed his National Certificate in Boatbuilding (Composite Sparmaking) (Level 4) at Marten Spars followed by a National Certificate in Business (First Line Management) (Level 4) at Southern Spars.

Completing the First Line Management qualification has been good for Andrew's career development and given him the confidence to take on more responsibility. It has also helped him accumulate good life and work skills.

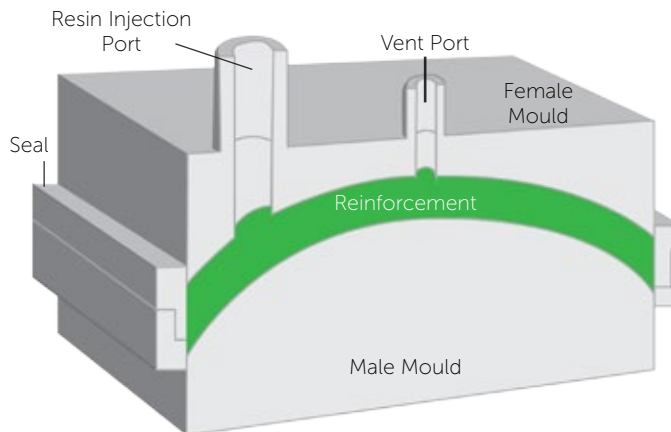
Andrew plans to continue developing his skills and experience and to move from middle management to a more senior role.



Some Composite Techniques:

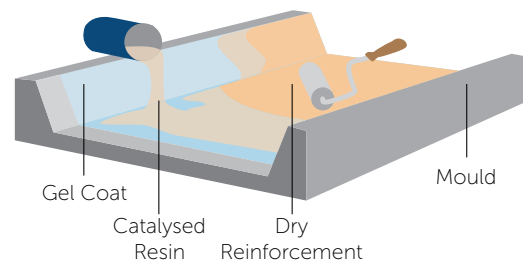
Resin Transfer Moulding:

A low pressure closed moulding process for moderate production quantities. Provides a uniform thickness, with 2 finished sides with low emissions. High quality parts produced by this method include automotive body parts, bathtubs, and containers.



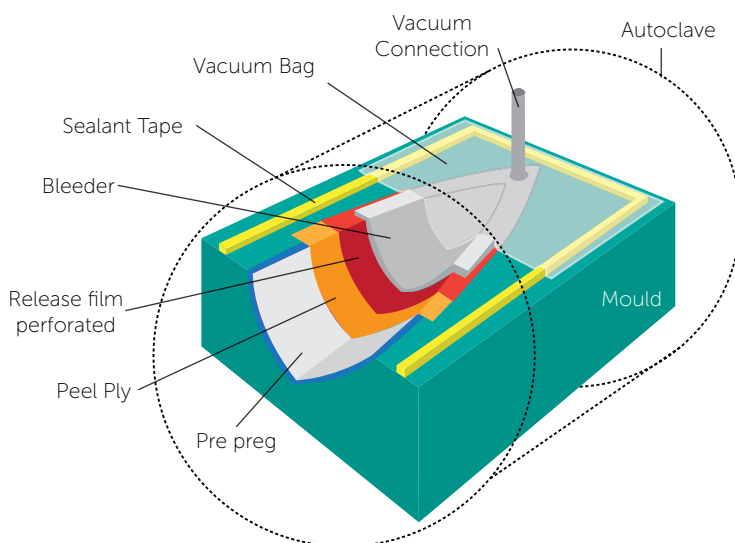
Hand Layup:

The simplest and oldest open moulding method of the composite fabrication processes. A low volume, labour intensive method especially suited for large components such as boat hulls.



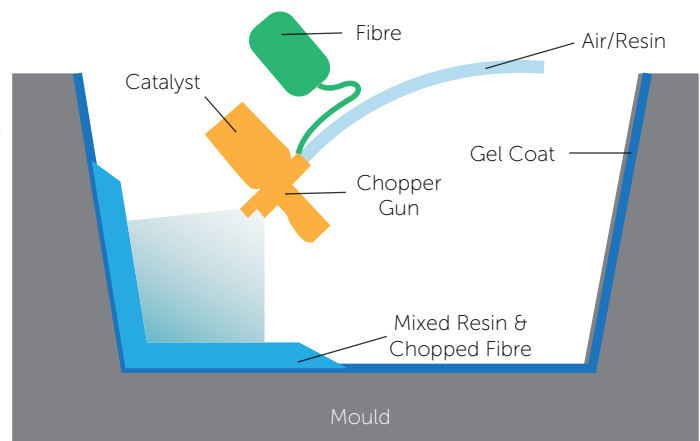
Pre Preg/Autoclave :

A modification of pressure-bag and vacuum bag moulding. This process produces denser, void free mouldings because higher heat and pressure are used for curing. It is widely used in the aerospace industry to fabricate high strength/weight ratio parts from pre-impregnated high strength fibres for aircraft, space craft and missiles.



Chopper Gun:

Sprayup is an open mould method that can produce complex parts more economically than hand layup. Chopped fibreglass reinforcement and catalysed resin (and in some cases filler materials) are deposited on the mould from a combination chopper/spray gun. Rollers or squeegees are used to manually remove entrapped air and work the resin into reinforcements.



11 | Events

Marine Trades Challenge

Build a Boat and Sail It



The annual Marine Trades Challenge is designed as a celebration of the skills of apprentice tradespeople working in the Marine and Composites Industries.

Teams of four, made up of two apprentices and one tradesperson, compete to build a boat in three hours and then race it around a course rowing, sailing and using outboard motors. Teams are judged on teamwork, presentation, safety, standard of build, and where they place on the water. The on-water race shows their skills and teamwork under tricky conditions.

This is an eagerly anticipated day out for the industry where apprentices can demonstrate their knowledge and skills to their supporters and to the industry. Though a fun event, it is highly competitive.



Graduation | 12

How we celebrate success

The annual NZ Marine and Composites ITO Graduation is a high profile industry event to acknowledge the success of each graduate. Following a formal dinner, a guest speaker presents every graduating apprentice with his or her National Certificate or Diploma.



We think it's a pretty big deal.

Parents and managers are invited to share in the achievements of the apprentices and to recognise them as valued and qualified industry employees. Most apprenticeships take between three to five years to complete and the graduations mark a major milestone in the careers of the graduates.



From here, some of the graduates will be considering the next stage in their career plan, perhaps taking on more responsibility in their current job, or undergoing further training.



13 | Off-Job Training

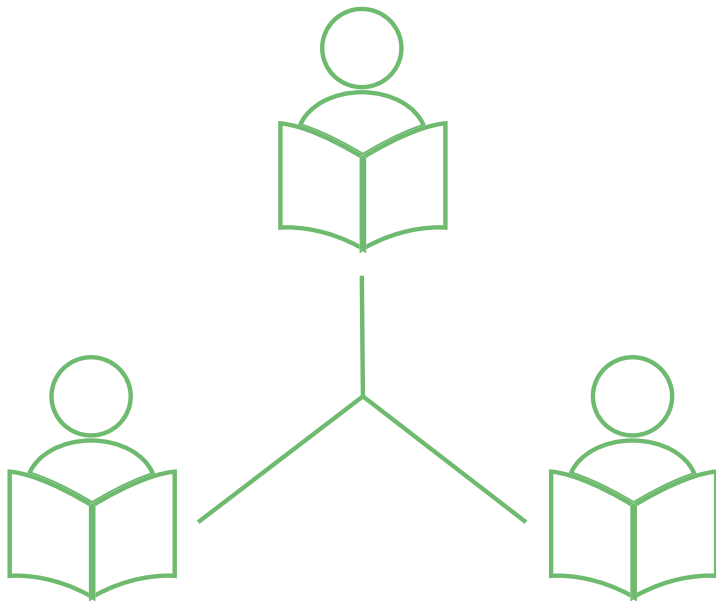
We'll sort out the off-job training

While the focus of apprenticeship training is based in the workplace, employers do not always have the time and the resources to provide specialised skills-based training and the theoretical knowledge that underpins the skills. This is why the NZ Marine and Composites ITO contracts Polytechnics and Private Training Establishments around New Zealand to deliver off-job training in the form of block courses and study groups.

Travel and accommodation subsidies are available for those apprentices who need to leave home to attend block courses (conditions apply). Apprentices unable to attend weekly study groups have the option of studying through "RudderLive".

Study Groups

With the support of their employers and NZMAC ITO, some apprentices engage in study groups with a tutor to boost their knowledge and skill-base. The aim of study groups is to supplement learning already taking place in the workplace.



RudderLive

Rudder stands for “Review, Understand, Detect, Develop, Engage, Recall”.

The NZ Marine and Composites ITO has developed an online Learning Management System (LMS) called RudderLive. Apprentices can log on anytime, download their programme material and study at times convenient for them. This gives them control of their learning process.

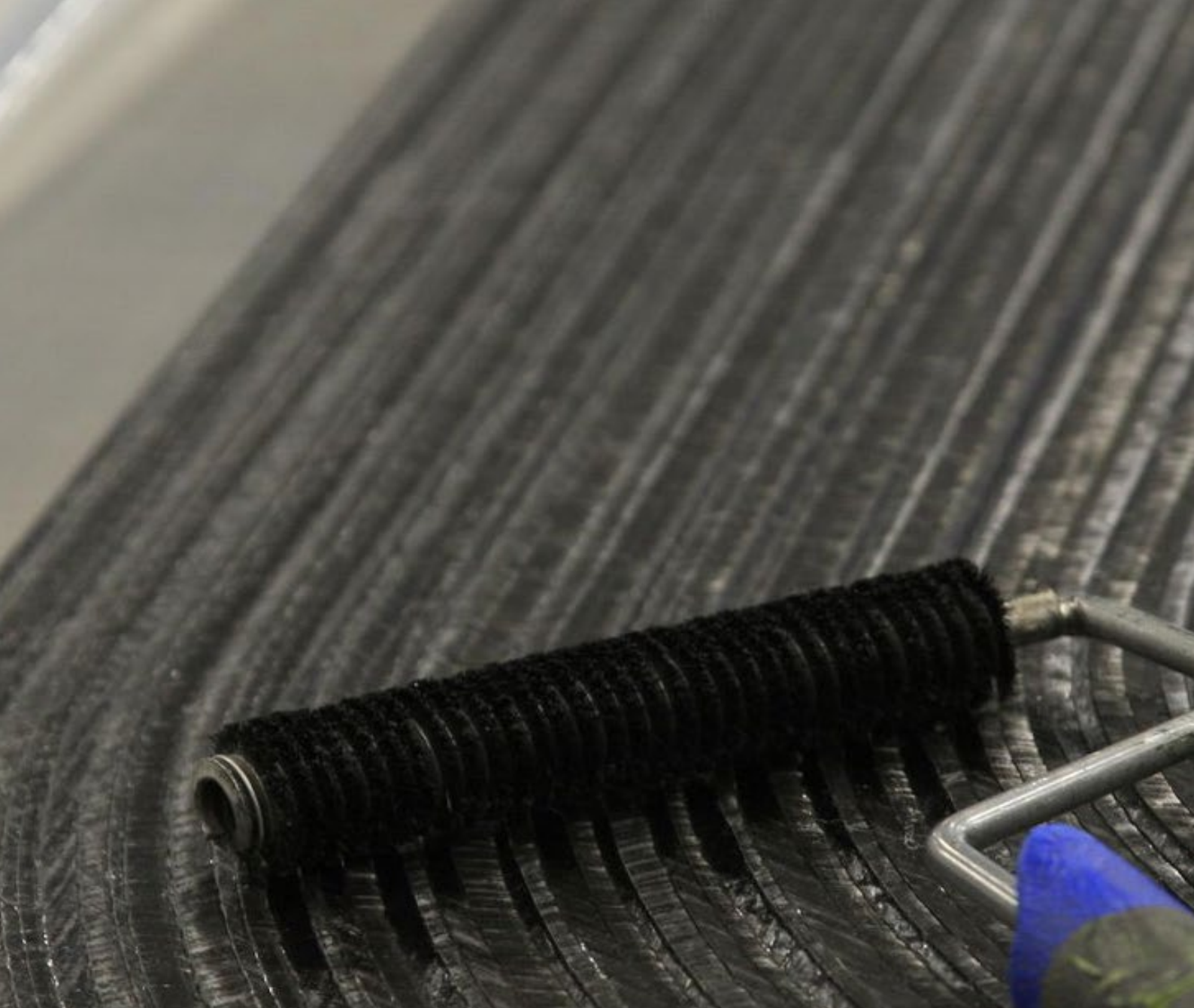
RudderLive does not replace the current training delivery model, but gives apprentices another option to help them to ‘steer their training to success’. Field Officers can also use the system to manage the individual learning plans of each apprentice and to provide mentoring and support services.

RudderLive has a range of features designed to appeal to this generation of apprentices including embedded video, self-marking online quizzes, interactive 3D modelling and e-lectures from industry experts. These features will help capture the interest and engagement of apprentices leading to better educational outcomes for them. The LMS can be updated regularly ensuring that the most up to date and engaging training resources are available to apprentices.

You can access RudderLive at rudderlive.nzmarine.com

Anytime, anywhere access





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