

# NATIONAL CERTIFICATE IN BOATBUILDING COMPOSITE SPARMAKING (Level 4)

203 CREDITS Version 5

An apprentice completing this NZQA registered qualification will gain the knowledge and skills required to be Marine Industry recognized and qualified as a competent **Composite Sparmaker**.

This qualification recognises the skills and knowledge required for apprentices working in the sparmaking sector of the Marine Industry, specifically in the manufacture of composite masts and spars.

In this qualification, apprentices undertake detailed training in composite construction methods, appropriate tools and machinery involved in sparmaking and how to assemble fittings and rigging. In addition, they receive an overview of the boatbuilding industry and gain a detailed knowledge of design drawings and calculations.

As superyachts and specialist racing yachts become more and more advanced, the need for skilled composite sparmakers is increasing. Working with advanced composite materials such as carbon fibre and elevated temperature cured composites, New Zealand composite sparmakers are helping to keep the country at the cutting edge of this sector, routinely providing services and solutions for some of the world's most advanced sailing vessels.

This qualification takes, on average 2.5 to 3.5 years to complete.

Continued on next page

Rory Protheroe



Rory Protheroe completed his National Certificate in Boatbuilding (Composite Sparmaking) Level 4 while working for Southern Spars, in 2005. Prior to that he had completed a pre-trades course at a Polytech.

His next step up was to a team leader position, building masts for superyachts. His current role is as an estimator in the sales team, and in the future he hopes to develop his career at Southern Spars further by moving into project management or sales. With this in mind he is working towards his National Certificate in Business (First Line Management) Level 4.

*“The training material and the trainers were very useful in helping me gain the skills and knowledge required to be a composite sparmaker” – Rory Protheroe.*

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### Unit Standard Content

Unit Number	Unit Title	Level	Credit Value
414	Demonstrate knowledge of the distribution environment	2	4
3161	Produce an epoxy resin item to a product specification for composites.	3	5
3165	Produce a laminated item using resins that cure at elevated temperatures for composites	4	6
3166	Produce an item using resin pre-impregnated reinforcement for composites	4	5
3170	Produce a laminate by vacuum bagging for composites	4	2
3171	Produce a cored laminate for composites	3	3
3177	Cure an item in an autoclave for composites	4	3
3183	Prepare pre-form materials for lamination for composites	3	4
3184	Prepare a mould for moulding composites	4	5
3185	Demould laminated items for composites.	3	6
3186	Finish product to specification for composites	3	5
3190	Repair damaged or faulty composites	4	5
3192	Provide for and attach fixings and fastenings in composites	4	4
3193	Apply quantity surveying to composite production	3	2
3198	Alter resin rheology with fillers, extenders and additives for composites	5	3
5433	Demonstrate knowledge of electrical and electronic applications for marine use	4	8
9913	Demonstrate knowledge of the New Zealand marine industry	2	3
9922	Produce templates and patterns used in boatbuilding	3	4
11788	Prepare fibre-reinforced composite substrates for marine surface coatings	4	5
18158	Select, use and care for hand tools used in boatbuilding	2	5
18159	Select, use and care for portable power tools used in boatbuilding	2	5
18160	Operate mechanical plant used in boatbuilding	2	12
18162	Calculate quantities and costs for boatbuilding projects	3	4
18163	Demonstrate a knowledge of boatbuilding construction drawings and produce related freehand sketches	3	2
18165	Demonstrate knowledge of computer technology used in the boating industry	3	6
18166	Participate in a project team in the boating industry	2	4
18170	Contribute to a project team in the boating industry	3	3
18171	Demonstrate knowledge of spars and rigging	3	5
23039	Demonstrate knowledge of the transportation of spars and rigging	3	4
23049	Demonstrate knowledge of composite technology for boatbuilding	4	6
23243	Identify and explain causes of material deterioration in the marine environment	4	8
23244	Identify and apply health and safety procedures for the boatbuilding industry	3	4
25119	Describe and safely control work aloft on yacht rigs	4	4
25120	Demonstrate knowledge of the design and specifications for yacht spars and rigging	4	4
25123	Interpret, select, and assemble components of yacht spars and rigging	4	6
25343	Identify boat fittings and fastenings	2	4
25344	Demonstrate knowledge of marine trades and expectations of employees	2	3
25345	Demonstrate knowledge of terminology used in the marine industry	2	6
26542	Demonstrate basic knowledge of the operation of recreational craft by day	2	6

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**Elective Unit Standard Content** Plus at least **20** credits from the following list:

Unit Number	Unit Title	Level	Credit Value
3179	Produce a laminate using a pre-wet machine for composites	3	2
3181	Produce a plug or pattern for composites	4	12
3182	Produce a mould or tool from a plug or pattern for composites	4	5
3196	Test properties of a composite laminate	4	10
9917	Demonstrate knowledge of boatbuilding methods	2	4
11661	Produce components by performing basic engineering drilling operations	2	8
11662	Produce components by performing basic engineering turning operations	2	12
11663	Produce components by performing basic engineering milling operations	2	12
18161	Perform measurements and calculations used in boatbuilding	2	5
23036	Describe infusion and resin transfer moulding processes used in boatbuilding	4	4
23040	Demonstrate knowledge of yacht spar and rigging systems	4	8
25113	Describe filling and fairing technology used in boatbuilding	3	4
25121	Maintain yacht spars, rigging and hardware	4	4
25122	Install and remove yacht spars and rigging	4	8
25152	Apply 2D CAD/CAM in boatbuilding	4	5

