Build Your Own Carbon Wingfoil Board

The step-by-step guide, from preparing the shape to the first session



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PART 1 – PREPARATION

1. Introduction and materials

1.1. About the project and general choices

Building your own board: many riders wonder about it and dream in front of the superb boards made by some amateur or professional shapers. But once you have gone through the websites that cover the subject, especially the dedicated Facebook groups and the many videos, one thing is clear: all the relevant information is very hard to pull together. Social networks are excellent tools for discussion and sharing, but they fall short as structured documentation. Searching through thousands of posts and comments is a real ordeal.

Hence the idea of this amateur guide, written above all for beginners: a knowledge base and working method drawn from my very first personal experience, in which I describe in detail how I built my first wingfoil board from A to Z. Constructive feedback is welcome: I will gladly add it so that everyone can benefit. Over the course of my research, I tried to put together a protocol that works: simple, accessible and very detailed, to guide you step by step towards your own project.

I am a curious, passionate, self-taught amateur. I like sharing ideas and gathering them in one place. A few years ago I had already written two completely free PDF guides on the same principle: a lamination guide for *Tiki* boards and a shaping guide on *Tiki Mafia*, which I hope still help kiters build their boards today. I haven't given up kiting, and I enjoy my sessions all the more as they remain very complementary to wingfoiling.

My starting point is that there is no point in reinventing the wheel, which avoids getting lost in untested or unproven experiments. There are countless recipes and building methods, and I cannot cover them all. Professional shapers won't reveal all the secrets of their recipes either, which I fully understand. The aim is not to compete with anyone, but to offer real help to anyone who wants to give it a go.

1.1.1. Why build your own board?

Building your own foil board is an exciting and unique adventure with many advantages, but also some challenges.

The advantages

- **Full customisation:** You can design a board perfectly suited to your riding style, weight, level and taste. You choose the dimensions, materials, shapes and colours.
- **Potential savings:** By buying the raw materials and building the board yourself, you can cut costs considerably (up to half) compared with buying a new board off the shelf, especially from the second board onwards, once you have the tools.
- **Learning new skills:** This project takes patience, precision and technical knowledge. It is the ideal opportunity to learn new skills and better understand how composite materials behave.
- **Personal satisfaction:** The sense of achievement and pride in having built your own board is second to none.
- **A unique experience:** It is a complete immersion in the world of shaping and composite construction.

The challenges

- **Time and commitment:** Building a board takes many hours of work. I didn't count them, but 60 to 80 hours for a first board seems a fair estimate. This depends on the level of finish, your DIY experience and your personal commitment.
- **Tools and materials:** You will need specific equipment and quality materials to get a strong, durable board.
- **Technical knowledge:** It is important to learn about working with resins and composites beforehand.
- **Trial and error:** You will probably make a few small mistakes on a first board. That is part of the learning process, but this guide will help you avoid most of them.

Before you start

- **Define your needs:** Which discipline do you ride? What is your level? What do you expect in terms of performance and volume?
- **Do your research:** Read up on the different materials, and on vacuum bagging versus wet lay-up.
- **Plan a budget:** Estimate the overall cost of materials and consumables, without forgetting the basic tools.
- **Find a mentor or reference sources:** Don't hesitate to talk to experienced people.
- **Be patient and persistent:** Don't get discouraged by technical difficulties.

1.1.2. Is this project for everyone?

The short answer is **yes**, with the right preparation and the right tools. However, you really have to want it, be reasonably handy and have free time (as well as a dedicated workspace).

If you don't meet these prerequisites, it is often wiser to hand your project over to a professional shaper.

Inflation has also pushed up the cost of raw materials. Many people think DIY (Do It Yourself) is very cheap, but the total bill for consumables, resin, cloth and starter tools — combined with the risk of ruining your first board — needs careful thought. If money is your only motivation, you are heading for a wall: for a first board, the initial investment (equipment and tools) is such that buying a good second-hand board is sometimes the better deal.

I estimate the all-in initial cost (tools, materials and consumables) of a first 100-litre full-carbon wingfoil board with a CNC shape at over 1,000 euros, depending on the tools you already own. Subsequent full-carbon boards will be cheaper (tools, materials and experience reused), but it will be hard to go below 700 euros. On the other hand, you can cut this cost sharply (to roughly 300 to 400 euros) with a fibreglass lamination, a hand-shaped EPS blank and no vacuum bagging.

To help you budget your project, I have also built a very complete online calculator (link at the end of the chapter): it draws up your shopping list and estimates your project's budget.

1.1.3. Useful sources, shapers and documentation (non-exhaustive list)

(List limited to makers offering wingfoil boards, all based in France.)

4.3. Box patches

4.3.1. Cutting and positioning

- **Stepped patches:** Cut 2 patches of 200 g/m² biaxial carbon, stepped, directly over the box area, to give a gradual change in thickness and avoid stress breaks.
- **The large V patch:** lay a large, very generous V-shaped reinforcement patch. *Careful, the perspective is misleading:* this large patch reaches roughly mid-length of the board.
  This is not a universal standard. The shape, length and orientation of the reinforcements must be adapted:
- to the position of the boxes;
- to the sandwich structure;
- to the internal braces/reinforcements;
- to the type of box;
- to the board's purpose;
- to the main lamination.

  Note: I was very generous with the V patch, which starts at the handle and covers the whole rear of the board. It is a personal choice, not necessarily needed to that extent, but for this very first board I wanted a rock-solid construction.



Fig. 4.12 – The large V patch laid dry.

Cutting the cloth folded in half, without creasing the fold, to get a symmetrical shape.



Fig. 4.13 – Cutting the patch from the cloth folded in half.

Managing the resin weight: *Important note:* Remember to weigh the dry cloth before bonding. This lets you calculate exactly how much resin you need (here, about 120 g of cloth for the large patch).
Positioning: As it was a first board, I wanted to make things easier with a repositionable spray adhesive made for lamination, to press and hold the carbon fibres in place so they don't move before wetting out.





Fig. 4.14 (left) – The large V patch: it reaches mid-length. Fig. 4.15 (right) – The V patch seen from the side.

Second box patch: Cut 3 to 4 cm longer and wider than the box.
Measured weight: 32 grams for this small patch.
Fibre orientation tip: On this small patch, I chose to cross the weave direction by placing it **perpendicular** to the large V patch. Crossing the weave directions spreads the loads better in all directions; plan for it when you cut the cloth.



Fig. 4.16 – The small cross patch, laid on the large one.

Tip for cutting rounded corners: Wherever possible, always go for rounded corners (especially on small patches) to avoid stress concentrations. **The technique:** Simply place a roll of tape (or a circular template) on the corners of the cloth and follow the outline with scissors or a utility knife.



Fig. 4.17 – Rounded corner drawn with a roll of tape.

Cutting in advance: Cut in advance and set aside, within reach and ready to use:

- The peel ply.
- The micro-perforated plastic film (or release film).
- The breather felt (or breather cloth).

The aim: Anticipate everything before mixing the resin, so you can go straight into vacuum bagging calmly as soon as the lamination is done.



Fig. 4.18 – Peel ply cut in advance.

Preparing the release film: The small carbon patch is cut and ready to lay. The **release film** (often blue) is also cut to the exact dimensions (length and width) of the area to cover, ready to go into the layered stack of the lamination process.



Fig. 4.19 – Small patch and blue release film, ready to lay.

4.3.2. Quantities and weighing

- **Working out the quantities for this project:** Based on the weight of the cloth (estimated at 120 g for the large patch + 32 g measured for the small patch).




Fig. 4.52 (left) – Deck side: the bottom carbon wrapped around the rails, to be covered by the deck lamination. Fig. 4.53 (right) – The finished bottom.

4.5. Mixes summary

All the quantities in the chapter. Resin and hardener are weighed at the manufacturer's ratio (100:30 by weight for my system); the ratio shown is the weight of mix relative to the weight of dry cloth.

No.	Step (section)	Cloth (dry weight)	Resin + hardener	Ratio	Notes
1	Nose and corner patches (4.2)	125 g/m² glass	about 30 g	–	Under vacuum (test); wet lay-up is enough
2	Box patches (4.3)	200 g/m² biaxial carbon: 120 g (V) + 32 g (small) = 152 g	247 g: 150 + 45, then 40 + 12	≈ 1.6	220 g would have been enough
3	Corrective filler (4.3.9)	–	5 g	–	Same mix as the sealing coat in chapter 2
4	Main lamination of the bottom (4.4)	200 g/m² carbon: about 318 g	607 g: 2 × (200 + 60), then 66.7 + 20	≈ 1.9	Just enough; planned 1.8 × the cloth

Wetting out before vacuum bagging: the excess resin goes into the breather. For a first board, allowing 1.6 to 1.9 times the cloth weight avoids dry areas; you can aim lower with experience. My weigh-ins (chapter 11): the vacuum removed about 115 g of resin from the box patches and 160 g from the bottom.

4.6. Going further

FACTORY : SURF VACUUM PROCESS ↗

Nose and tail reinforcements

HOW to MAKE a NOSE PROTECTOR - Windfoil/Windsurf - Tuto#6 ↗

COMMENT POSER ET COUPER LA FIBRE DE VERRE (STRATIFICATION) (in French) ↗

11. Epilogue: review and first session

11.1. The weight, step by step

The weigh-ins made during the build, put back in chapter order. “Weighed” means a weight measured on the scale; the other values are weighed parts or calculations.

Step (chapter)	Added	Board weight	Note
CNC-machined 20 kg/m³ EPS blank, 6'1 x 26"	–	2,300 g	Weighed
Airex plate and Chinook US boxes (ch. 2)	596 g; 696 g after bonding the tracks		Bonding the tracks adds about 100 g
FCS handle and valve, Airex block (ch. 2)	54 + 2 g, and 20 g		Parts weighed
Leash plug and its Airex block (ch. 2)	7 g and 10 g		Parts weighed
Blank and fittings (calculation)	≈ 790 g	≈ 3,090 g	Calculated, not weighed
Sealing coat, bottom (ch. 2.9)	≈ 160 g	≈ 3,250 g	Estimated
Sealing coat, deck (ch. 2.9)	≈ 150 g	≈ 3,400 g	Estimated
Glass patches, corners and nose (ch. 4.2)	30 g of mix + the glass		
Carbon box patches (ch. 4.3)	152 g of carbon + 247 g of mix	3,715 g	Weighed; 3,830 g calculated
Main lamination of the bottom (ch. 4.4)	≈ 318 g of carbon + 607 g of mix	4,480 g	Weighed; +765 g
Deck PVC sandwich (ch. 5)	PVC + 130 g of carbon + 310 g of mix	4,940 g	Weighed; +460 g
Inserts and shells (ch. 6)	inserts 30 g + shells and bonding	not weighed	
Main lamination of the deck (ch. 7)	not weighed	not weighed	
Opening the boxes and sanding (ch. 8)		not weighed	Sanding removes a little weight
Filler coat and decoration, 4 coats (ch. 9)		6,110 g	Weighed; +1,170 g since the sandwich
Logo, hot coat and pad: finished board (ch. 10)	hot coat (≈ 500 g of mix prepared), logo and pad	6,700 g	Weighed; final weight, +590 g

Fittings and bonding: about 790 g for 2,300 g of foam, before any lamination. Bonding the tracks alone adds about 100 g.

What the vacuum removes: after the box patches, the board weighed about 115 g less than expected (3,715 g weighed against 3,830 g calculated), and about 160 g less after the bottom. This is the resin that went into the breather or stayed in the pot: vacuum makes the board lighter, but only by removing the excess.

Room for improvement: on the bottom, about 450 g of resin remains for 318 g of carbon, i.e. 1.4 times the cloth weight. Under vacuum, you can aim for about 1 to 1 (this is also the advice of other shapers: as much resin as cloth, “a touch more”). It is the easiest weight saving for a next board.

The deck sandwich: +460 g weighed for the PVC sheet, the 130 g patch and the resin. *The sheet itself weighs about 110 to 120 g (3 mm at 75–80 kg/m³, about 0.5 m²): the rest is the resin left in the cloth.*