

# Greener Surfboard

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## Tools used in this project

- [Angle grinder](#) (1) or *Dremel rotary tool with sanding disc*
- [Calipers](#) (1)
- [Coping saw](#) (1) or *jigsaw*
- [Drill](#) (1)
- [Drop light](#) (1)
- [Framer's square](#) (1)
- [Hole saw](#) (1)
- [Marker](#) (1)
- [Pencil](#) (1)
- [Round rasp](#) (1) or *round file*
- [Spring clamps](#) (2–3) or *ratchet clamps, for positioning fins*
- [T-square](#) (1)
- [Utility knife](#) (1)

## Parts relevant to this project

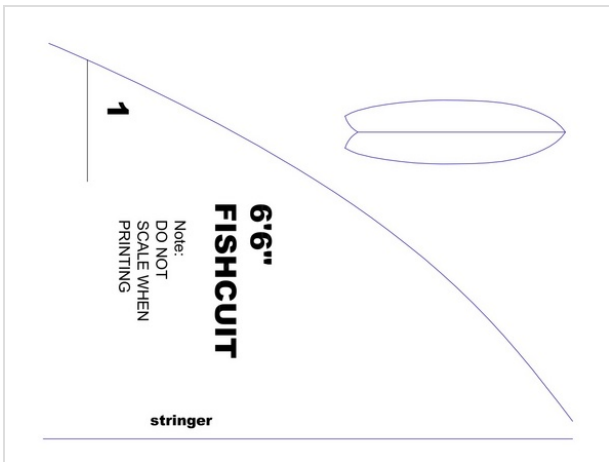
- [Greenlight Deluxe Eco-Friendly Starter Kit](#) (1) \$395; *Includes EPS foam blank, epoxy resin, bamboo stringer, bamboo cloth, bamboo panel for fins, plus hand saw, Surfform rasp, small plane, resin spreader, laminating roller, foam sanding pad, tapes, gloves, and sandpapers.*
- [Templates](#) (1) *Download at Greenlight Surf Supply*
- [Distilled water](#) (1) *for mixing spackle*
- [Acrylic paint](#) (1) or *similar, optional, for pinlines*
- [Wood](#) (1) *to make sanding blocks*
- [Lumber](#) (1) *to build a shaping rack and glassing racks*
- [5-gallon bucket](#) (2) *filled with sand, for glassing racks' bases*
- [Wood screws](#) (1) *to build a shaping rack and glassing racks*

Traditional surfboards are fragile, and they're made of toxic goo that ends up as landfill. A DIY kit from Greenlight Surfboard Supply is the ticket. For \$395 it's got all the materials and tools you need to make a tougher, greener epoxy board using expanded polystyrene (EPS) foam that's recyclable. Greenlight's new lamination technique, using stretchy bamboo fabric instead of fiberglass cloth, is easier and safer. And when this board finally fails, you can recycle or compost most of it. Nice. You can shape it in a weekend, but plan on a week or so to glass it.



**Step 1 — Get your kit and download a template.**

- I made a twin-fin “fish” with Greenlight’s 6’6” deluxe kit. They’ve got kits ranging from 6’0” shortboards to 9’8” longboards. Whatever style you make, it’s a big help to keep a similar board on hand for reference.



**Step 2**

- Download a surfboard outline template from Greenlight, or make your own by tracing a favorite board.
- Print out the Greenlight template and tape it together on the numbered marks, then cut out the completed curve. You can use it as is, or transfer it to heavier kraft paper or cardboard.



**Step 3 — Glue and cut the foam blank.**

- Glue the blank halves to the stringer, as flush as possible.
- Trace your template on the bottom and saw it out. If you’re making a swallowtail or other delicate tail shape, don’t cut that out yet (it’s fragile).
- Now clean up the rails, squaring them with 36-grit sandpaper on your 12” sanding block.
- **CAUTION: Spare your lungs and wear a respirator or particle mask when sanding EPS foam or epoxy.**





**Step 4 — Level the deck and bottom.**

- Plane down the stringer where it rises above the foam, then use your 24" sanding block to level the foam and stringer on the bottom and deck.



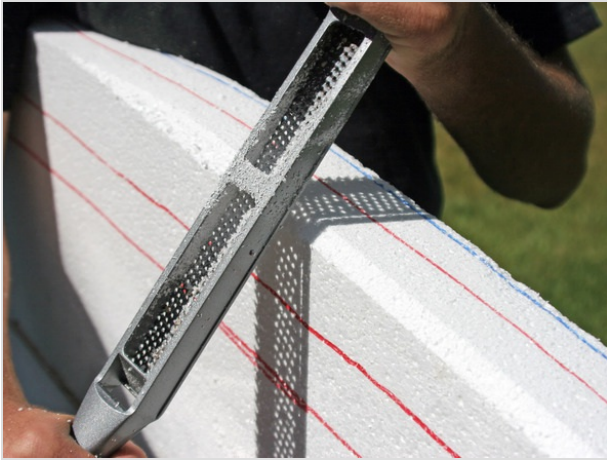
**Step 5 — Shape the foil and bottom contour.**

- For a thinner board, keep sanding with your 24" block. The pros use a power planer, but you're likely to lose control and mow too much foam. I recommend going slow, using the sanding blocks.



**Step 6**

- For steeper waves, you can put more "rocker" curve in the bottom. For easier turns, I put some "vee" in the bottom, at the tail. This helps the board to roll from rail to rail when you're turning.



### **Step 7 — Shape the rails.**

- Following Greenlight's diagrams, draw rail bands with a marker. Use the rasp to bevel the foam between bands: bottom bevel, deck bevel, then a second deck bevel that bisects the first.
- You'll leave the rails' bottom edges sharp in the tail (more bite for turning), but round them off farther forward (more forgiving).



### **Step 8**

- Then use the 100-grit sanding screen to round the bevels into curves. It works well! Don't round off your sharp edges in the tail, though.



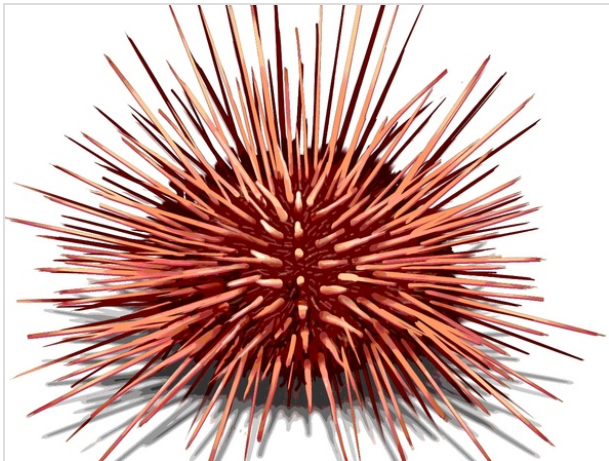
### **Step 9 — Blend the deck into the rails, nose, and tail.**

- With 60-grit on your 12" block, blend the deck into the rails and tail. If you're making a swallowtail, now's the time to cut it out.
- To thin the nose, plane down the stringer, sand the foam down evenly, then blend.



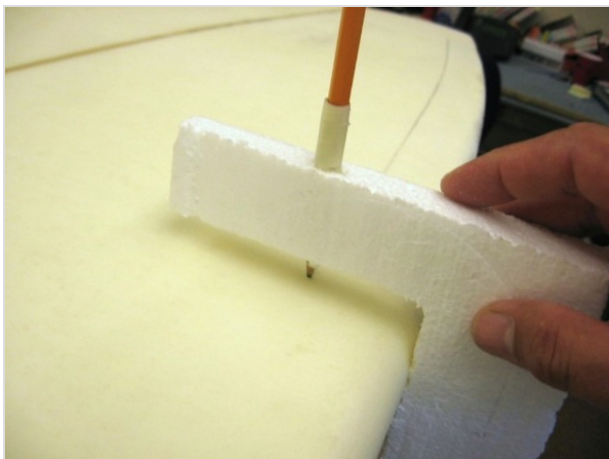
**Step 10 — Sand and spackle.**

- Sand the board with 80-grit on your foam sanding pad and remove any dust. Everything look even and symmetrical? You're done shaping.
- To seal the EPS foam, mix lightweight spackle (DAP Fast 'n Final or Custom Patch-N-Paint) with water to the consistency of thin mayonnaise, then spackle the board, scrape away excess, and let it dry. This type of spackle uses silica microcells as filler; pro shapers say it lets the epoxy resin penetrate and bond with the foam, but prevents the foam from soaking up too much.



**Step 11 — Add artwork and fin boxes (optional).**

- Stick down artwork with resin, working out any bubbles. This kit comes with super-thin paper for printing graphics. You can also paint your board using water-based acrylic or latex paints.
- Most fin boxes are installed before laminating; follow manufacturer's instructions. Fin placement depends on board style, so copy a board or consult Greenlight or <http://www.swaylocks.com>.



**Step 12 — Laminate the bottom.**

- Pencil a lap outline on the deck 2½" from the edge, using a jig of scrap foam.
- Lay down double-sided tape all around the deck, just inside this lap line.




### Step 13

- Stretch bamboo cloth tight across the bottom, up over the rails, and down onto the deck tape. Much easier than fiberglass! Pull it tight and smooth, with no wrinkles on the rails. Minimize overlaps in the tail; you'll have to sand them out later. At the tail and nose, where it's tightest, tape excess fabric to the deck so it can't pull away.



### Step 14

- Put on 2 pairs of latex gloves, and mix up 9oz of epoxy resin. The formula is 2 parts resin, 1 part hardener, and 1ml of Additive F per ounce of hardener. Measure carefully: too little hardener and the resin won't set; too much and it'll get hot and set in the bucket, "exotherming" in a chain reaction. Stir well for 1 minute.
- **CAUTION: Wear disposable gloves and eye protection when working with epoxy resin; it can irritate skin and eyes, and can cause skin sensitivity with repeat exposure. Additive F is mostly xylene; keep it off your skin and don't breathe it.** 
- Using a paintbrush, saturate the fabric on the rails, working out any bubbles, and pull off the excess resin into your bucket.
- Flip the board, and toss the first pair of gooey gloves. Saturate the entire bottom using the plastic spreader, working small areas from stringer to rails. Leave no dry spots. Mix more resin as needed.



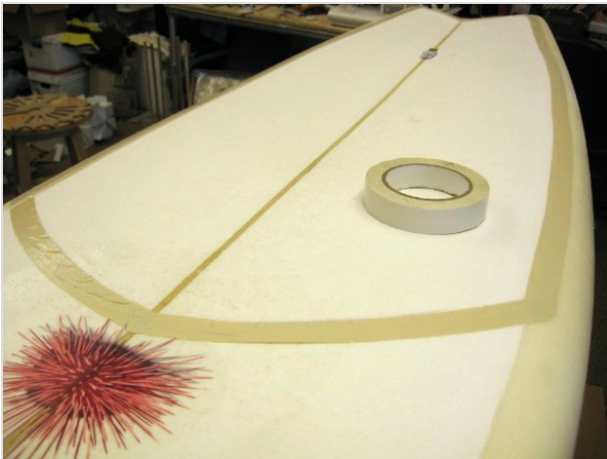
### Step 15

- Run the laminating roller over the entire bottom and rails with moderate pressure; this strengthens the bond between the epoxy and foam.
- Let the epoxy cure overnight.



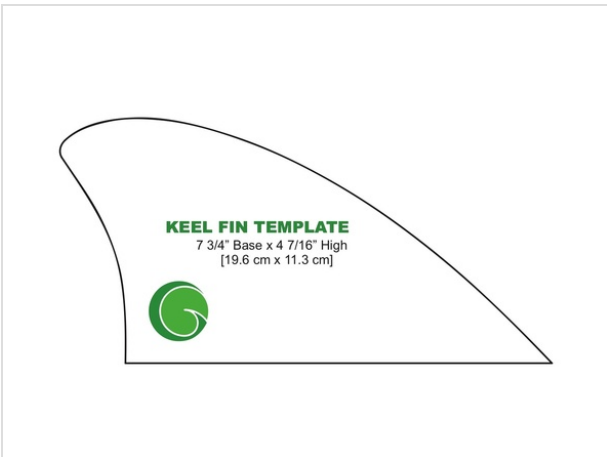
**Step 16**

- When the epoxy's cured, use a small block and 60-grit to sand down any wrinkles or overlaps on your rails.
- Score along the lap line with a utility knife, then peel the tape up and snap off the excess fabric. Sand the lap flush to the deck foam, and remove all dust.



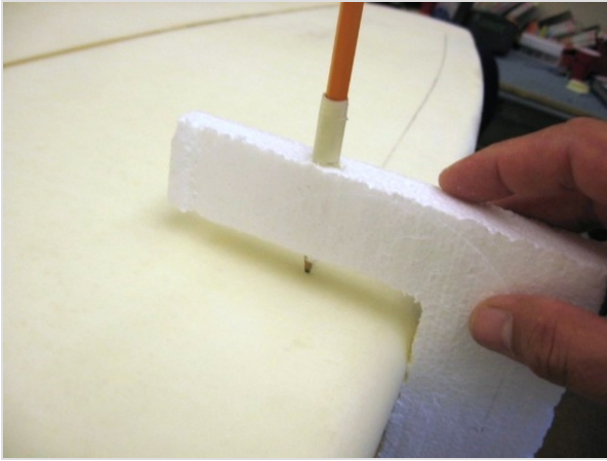
**Step 17 — Laminate the deck patch.**

- Reinforce 2/3 of the deck with a lamination: put double-sided tape outside the lap line, stretch bamboo fabric onto it, and laminate with 9oz resin. This strengthens the deck where you'll jump and stand on it. You can see the finished deck patch here (in the red box).
- Let the epoxy cure, then sand the laps flush to the foam, and remove any dust.



**Step 18 — Shape and laminate fins (optional).**

- Download a template from Greenlight or make your own template by tracing fins that you like.
- Cut fins from the bamboo panel with a coping saw. Foil them using a grinder, Dremel, or 60-grit block. Laminate in bamboo fabric, and sand with 80-grit. Be sure and stretch the fabric tight; mine was too loose and drank up too much resin.



**Step 19 — Laminate the full deck.**

- Draw a lap line on the bottom, put down double-sided tape inside this line, and laminate the entire deck and rails, as you did the bottom. Start with 9oz of resin; you'll probably use 18oz.



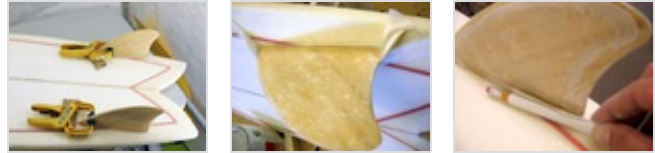
**Step 20**

- Score carefully — don't cut your bottom lamination. Sand laps flush. Congratulations — your board is “glassed” in bombproof epoxy, with double-strength rails and deck patch. Lightly sand with 60-grit on your foam pad, and remove dust.



**Step 21 — Paint pinline (optional).**

- It's traditional to hide lap lines under painted “pinline” about 3/16" wide. Use masking tape and acrylic paint, and pull up the tape while it's wet. I did the rail laps on the bottom and deck, plus the deck patch lap.



### Step 22 — Glass on the fins.

- Use clamps to hold the fins at your chosen toe-in and cant angle, as you glue them on with a little epoxy thickened with bamboo dust. Let it cure.
- Strengthen the fin bases with “fillets” of resin: make a masking-tape dam around one side of each base, then tip the board on its side and pour a little resin along the bases, building them up about ¼”. Let cure, then repeat on the other side.
- When the epoxy is cured, sand your fillets nice and round using a pencil wrapped in 80-grit.



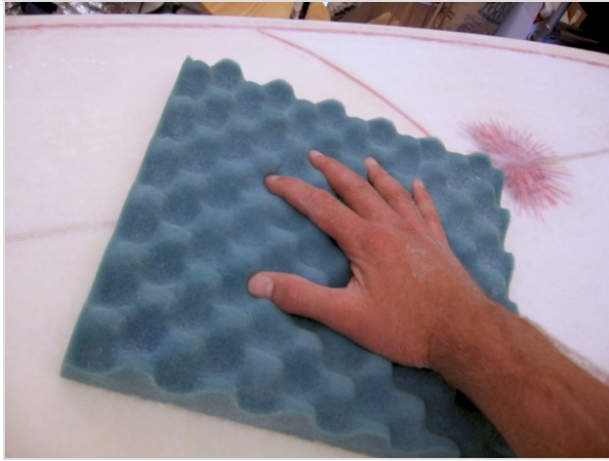
### Step 23 — Hot-coat the board.

- “Hot coat” is shaper-speak for the second coat of polyester resin, formulated to cure quicker, generating heat. Your epoxy hot coat won’t get hot, but serves the same purpose: to smooth the board and fill in the lamination texture.
- Lightly sand with 120-grit and remove dust. Mix 12oz of resin with double Additive F (2ml per ounce of hardener). Paint the deck and rails, forcing resin into the fabric texture. Go over it again lightly to spread it evenly, letting the brush do the work. Scrape drips off the bottom, and let it cure.



### Step 24

- Flip the board, sand down drips, and remove dust. Run masking tape around the rail just below the centerline, to save the deck from drips. Around the tail, add a resin dam of masking tape, sticking up; this will make a nice sharp edge.
- Now paint the bottom and fins with 12oz of resin. Let it set 2 hours, then pull off the drip tape and let it cure.



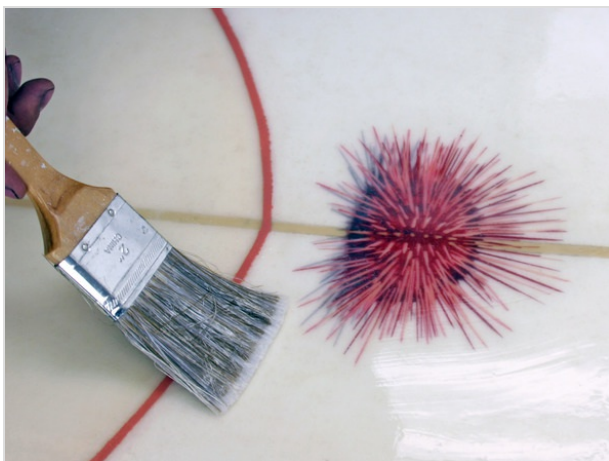
**Step 25 — Sand the hot coat.**

- Sand the board well with 80-grit, then 120, on up to 220. A power sander can be handy, but go easy; don't oversand into the fabric. I recommend hand sanding.
- Use the foam sanding pad on the rounded rails, and a hard block on the sharp rails. Hand-sand the fins.



**Step 26 — Install the leash plug.**

- Cut a 1¼" hole 3" deep in the deck, on the stringer a few inches from the tail.
- Clean the hole so the leash plug fits flush to the deck.
- Pour in a bit of resin thickened with bamboo dust, place the plug, and patiently drip resin around it to fill the gap.
- Let it cure and sand it flush.



**Step 27 — Gloss-coat the board (optional).**

- Paint a thin coat of resin mixed with double Additive F, and let it cure.
- Sand with 320-grit and buff to a mirror polish.



**Step 28 — Go surfing!**

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This project originally appeared in [MAKE Volume 19](#).

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