



Thank you for your purchase of the 3D printed deck fittings, aka “Maroske Fittings”. I’ve been using a version of these for over ten years and they are an elegant solution for rigging your prized kayak. This guide will outline the method that we use here at Turning Point to install them on our boats. We show the tools and supplies that we use, you may have preferences and feel free to use what you feel comfortable using for each of the steps.

- Joey Schott

Installation Guide

Supplies needed:

Adhesive- West System GFlex 655 Epoxy kit or Methacrylate Adhesive

Fiberglass cloth- 4oz E-Glass

Epoxy

Chip brushes

Masking Tape

Drill

1/4" drill bit

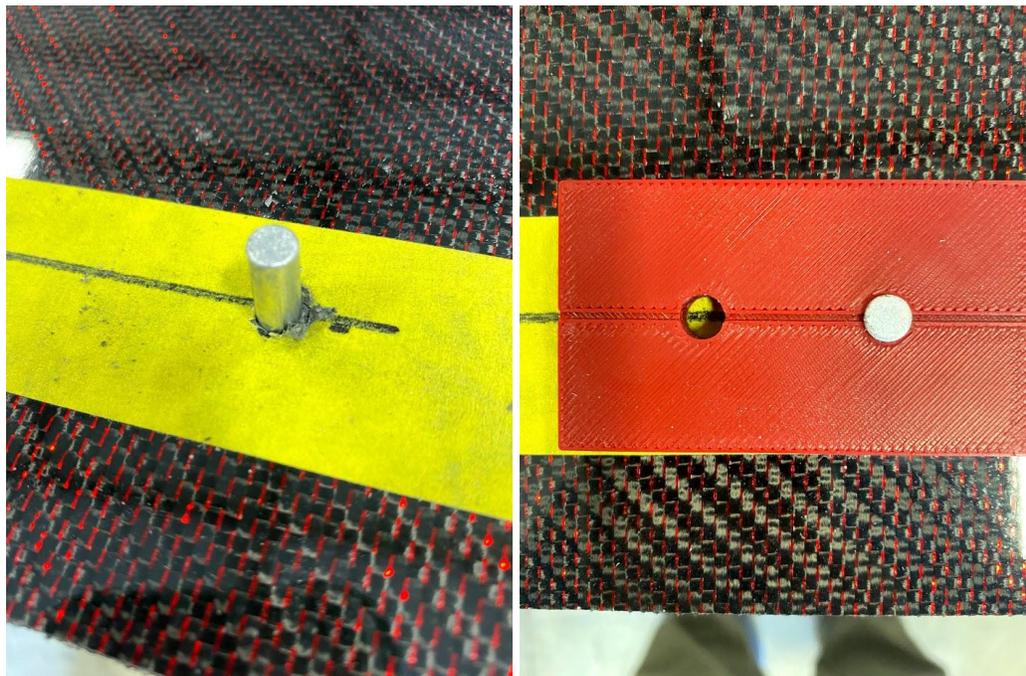
1/2" Drill bit

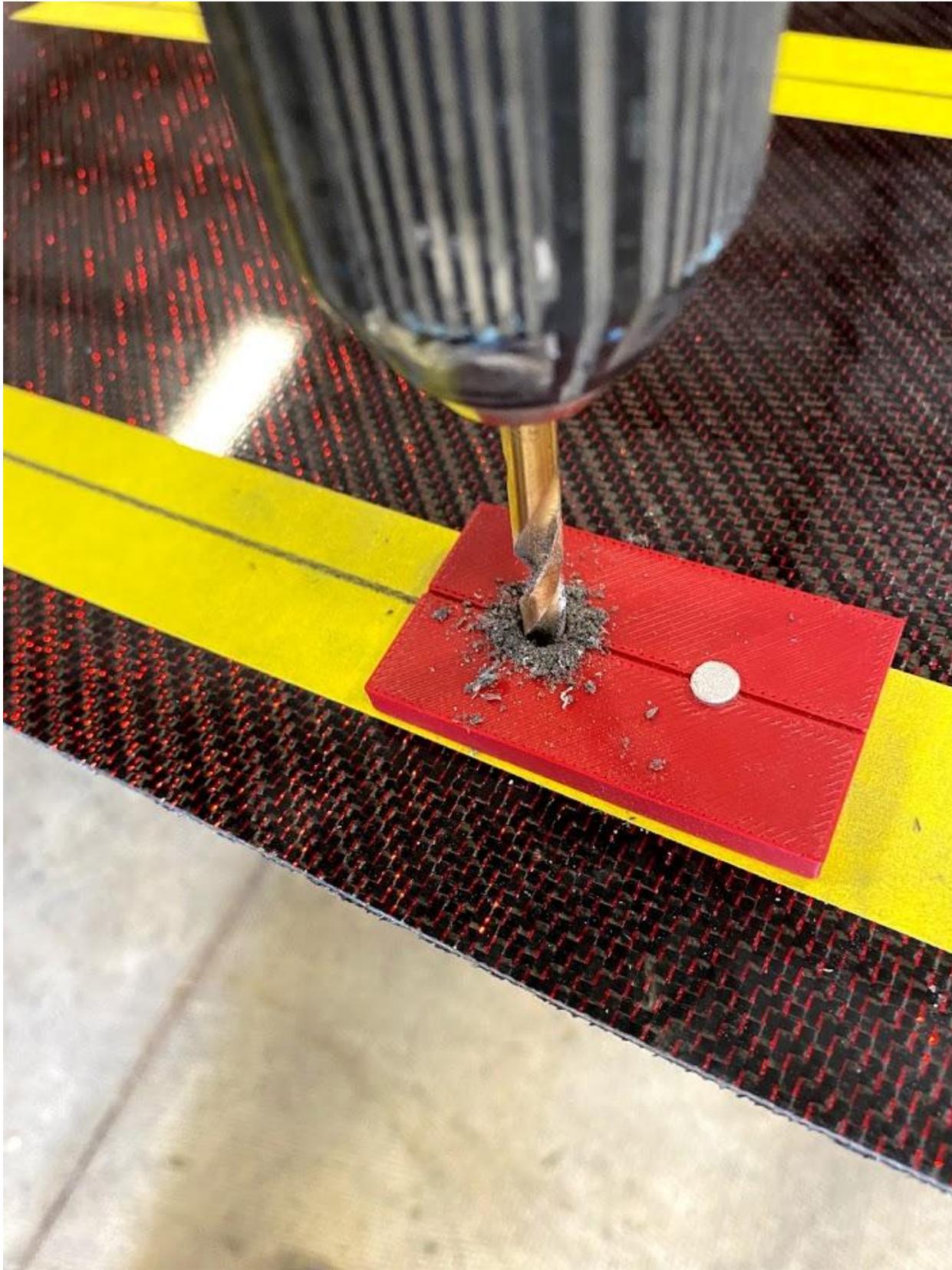
3/4" or larger countersink bit

Tapered Drill grinding stone (Optional)

Spherical Grinding stone (Optional)

Start by determining the location for the fittings. Put tape over the location for easy marking with a suitable pen. Once the locations have been determined, you can start by drilling pilot holes for the drill guide. Use the 1/4" drill bit to drill the first hole. Insert the dowel into the hole and place the drill guide over it, engaging the dowel into one of the guide holes. Line up the guide and drill the second pilot hole.





Next, the holes need to be drilled to their final size of $\frac{1}{2}$ ". I prefer a stepped drill bit as it self centers and cuts cleanly without tearout. If you prefer a different bit, feel free to use it. Taper the holes with the conical grinding stone to clean up the cut and create a very small chamfer.

When drilling the holes on a curved surface, make sure the drill is oriented so that the bit is straight vertically to match the fitting outlets.



The extension tubes on the fittings are $\frac{1}{2}$ " and the holes are the same size. The holes will need some clearancing to be able to pass the fittings through. Use the conical stone on the back side to clearance until the fittings pass through easily. This will also provide a small chamfer to aid in the seal/bond once the fittings are permanently installed. Trial fit the fittings as you don't want surprises when things get sticky!



Once the fittings have been mocked up and you are happy with the fit, it's time to prep for the install. The adhesive selection is important, since standard laminating epoxy does not bond well with ABS plastics. Our first choice is West Systems GFlex 655 Epoxy. Be sure to follow the directions supplied in the box completely. Rough up the surface of the fittings and "flame treat" them to oxidize the surface. (Be careful not to get them too hot as the 3D printing material has a low melting point.) This will ensure a good bond to the fittings. The second choice is a good Methacrylate Adhesive. It is often referred to as a "plastic bonding" adhesive found in your favorite big box home store. The only issue with using this adhesive is that it must fully cure before adding the fiberglass cloth and epoxy. Stick with GFlex unless you can't obtain it easily.

*****For installation in a Wood Strip or Stitch and Glue Kayak, seal the holes with unthickened epoxy to prevent water intrusion. This is super important as relying on the epoxy used in the bonding process to seal the end grain is not a good practice.*****



Sand the areas around the holes to prepare it for bonding. Tape off the area around the fittings. This will serve as a trim guide for the fiberglass and prevent epoxy from migrating to areas you don't want it to be. Cut your fiberglass into squares that are appropriately sized to cover the fitting and the area around them. Have them handy as things will move quickly from here.

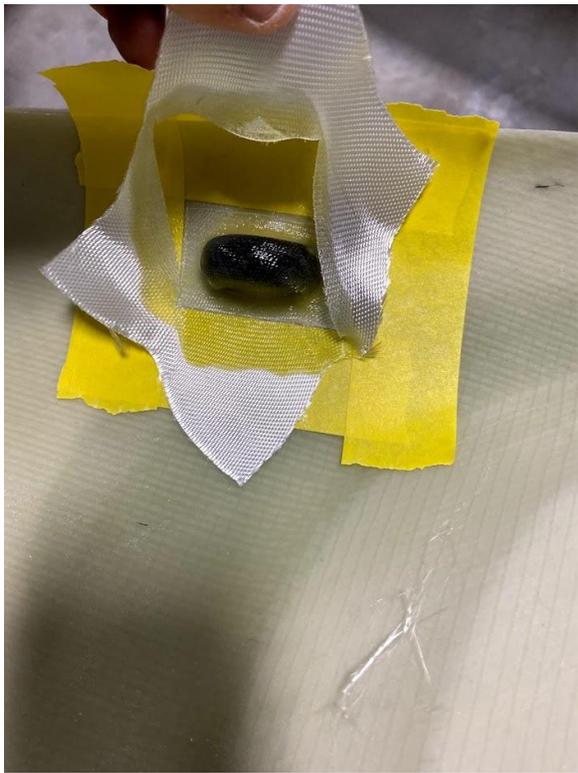


Now it is time to break out the sticky stuff! Pack the flange area with GFlex without getting it inside the fitting. You are looking to get a good amount of squeeze out to ensure the fitting is properly bedded. Pack the sides of the fitting with epoxy and create a “mound” to surround the fitting. Pack it all around to fill around the flange and create a fillet that the fiberglass can conform to.



While the GFlex is still “wet” start to add the fiberglass cloth and work it into the epoxy. Place the cloth on the bias as it will stretch and conform much easier. Wet out the fiberglass with unthickened resin and make sure there are no air pockets trapped between the fiberglass and the surface. This will ensure a watertight and strong installation. Trim the fiberglass before it completely cures, while it is still green, and remove the tape. The back side of the install is done!





To finish the installation, the extension tubes will need to be trimmed flush with the surface. For the Wood Strip and Stitch and glue folks, it is as simple as grinding them down flush to the surface. Use the conical grinding stone in your drill to put a chamfer on the edge. Seal any bare wood with epoxy.

For the composite installs, it is a little more complicated. This is the method we use on our boats and it works well.

Cut the tubes down by using a countersink bit in the drill. Use a slow speed to keep the bit smoothly cutting and reduce the chance of chatter. Carefully cut the tubes down to the surface, stopping to check progress and clearing the area in order to see progress. Once they are cut down satisfactorily, the holes can be chamfered with the conical and round grinding stones. It is very important to chamfer the edge of the gelcoat on the composite installs to prevent cracking.

We hope this guide is helpful in rigging your kayak. If you have any questions, feel free to contact us for help.

Thank you again!





