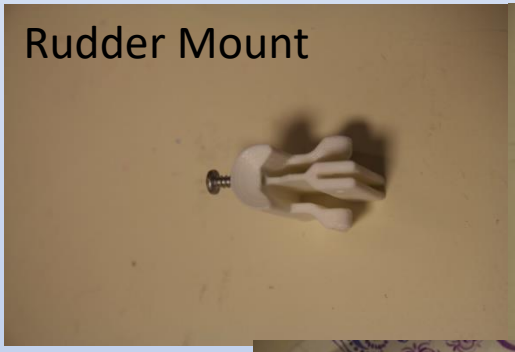
Bottle Cap Preparation



The purpose of this procedure is to secure the rudder mount to the bottle cap and seal the air vent hole with waterproof epoxy.

Safety

- Wear approved eye protection.
- When using epoxy, work in a well ventilated area, use gloves, and follow manufacturer's safety instructions.
- Epoxy can be messy - Use a disposable non-reactive surface for mixing area. A paper plate or scrap of cardboard works well.

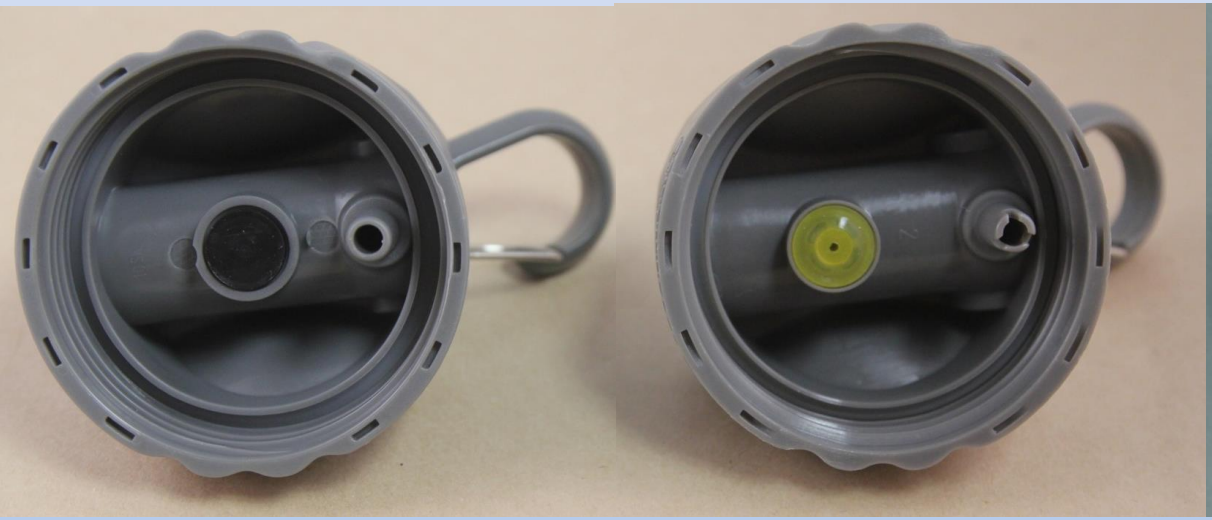
Things to Remember

- Squeeze all the contents (reagents) out of the epoxy packet and mix them thoroughly so that the epoxy will set hard.
- Bottles have multiple cap designs (more info below). The 3D printed rudder mount, which fits on the back of the cap, has a choice of screw holes to accommodate different cap designs. Find the hole that works for your cap.

Remove Cap, Mouthpiece, and Straws

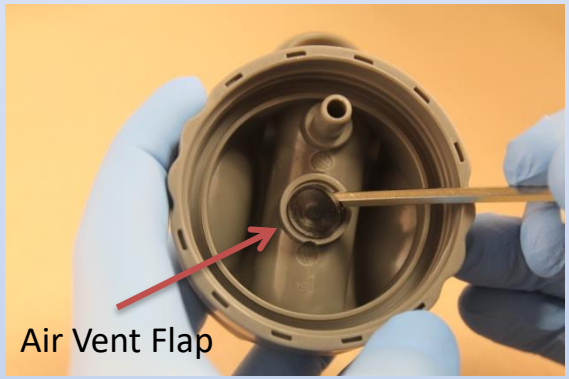
1. Remove the foam rubber mouthpiece from the cap and save it for the Buoyancy Engine Assembly step.
2. Unscrew the cap and remove the plastic straws from inside the bottle.

Why does my cap look different?



The difference between the three versions of bottle caps is the location and size of the air vent holes. Don’t worry if your cap looks different than the ones pictured later in this section! The steps are the same for all three.

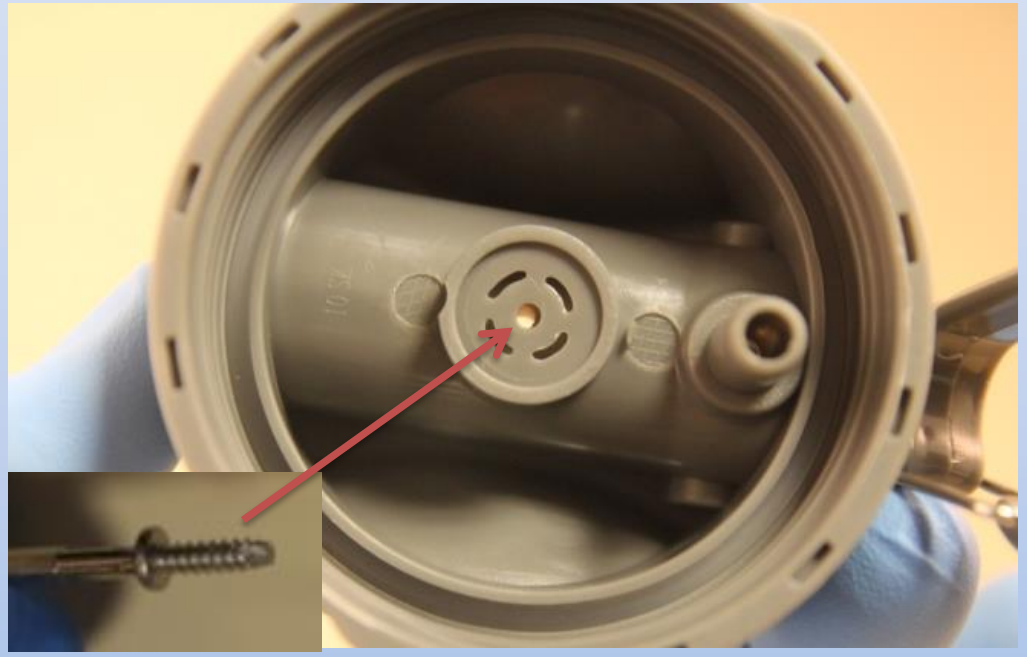
Prepare Cap for Rudder Mount



Use a flat-head screwdriver or needle-nose pliers to remove the small rubber air vent from the cap.

Slide the rudder mount down to the cap nozzle base. Look to make sure the cap's vent hole lines up with one of the rudder mount holes.

Test Fit Screw Through Cap Vent Hole



Remember – the vent in your cap may look different!

While the holes are aligned, use a self-tapping screw to cut the threads in the rudder mount hole.
Tap slowly – Remove and restart the screw at least twice to clear the plastic chips.

Mark Position of the Rudder Mount

1. With the screw in place, use a permanent marker to make alignment or witness marks on each half of the assembly.
2. These marks will allow for easier realignment of the rudder mount and air vent screw holes when epoxy is added.
3. Remove the screw and rudder mount in preparation for epoxying.

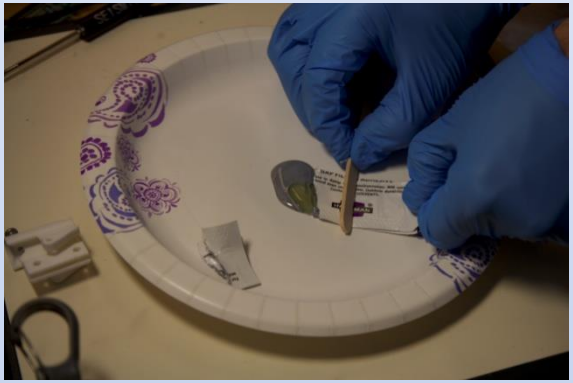
Prepare Waterproof Epoxy
Use Protective Gloves

Tip: Before mixing epoxy, familiarize yourself with the next 3 slides so you are prepared

Squeeze contents of the epoxy packet to one side.

Cut with scissors or tear open the opposite side of the packet.

Mix Epoxy Reagents Thoroughly



Use a popsicle stick to squeeze **All REAGENTS** onto a disposable mixing surface.

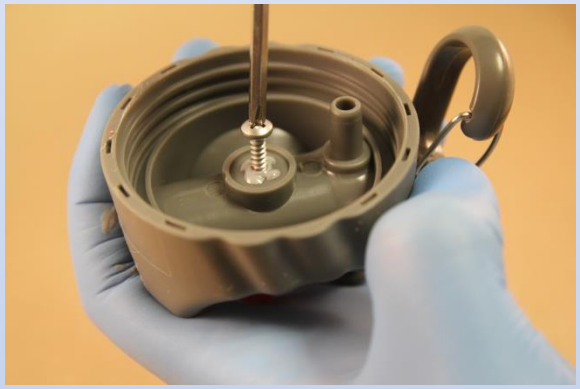
- **Mix contents VERY thoroughly to a solid grey color.**
- Work steadily through the rest of these instructions before the epoxy sets-up. (Cure time is 20-30 minutes.)

Apply Mixed Epoxy to Cap Channel

- Use the popsicle stick to apply epoxy generously.
- Cover the entire rudder mount area, **Especially** the air vent hole.

- Slide the rudder mount into position.
- Use the witness marks made earlier to realign the rudder mount.

Secure the Rudder Mount



From the inside of the cap, tighten the rudder mount into position with a #6 screw.

Apply extra epoxy on and around the screw head and around the rudder mount. Set cap aside overnight to dry.