

## CASTING WITH EPOXY RESIN USING A DESICCATOR CHAMBER, VACCUUM PUMP AND PRESSURE CHAMBER

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Below describes our process of casting fossil replicas in epoxy resin using a technique developed to cast Burgess shale specimens.

### Equipment used:



Desiccator chamber attached to a vacuum pump.



Cast iron  
Pressure  
Chamber



Plastic container with a large screw inserted into the bottom side of the container



Follow the mixing instructions for your type of epoxy resin. In this example we use a 2-part epoxy resin

Pour out approximately a bit more than half the volume needed for your cast of Part "A" into a plastic container.



Pour out an equal amount of Part "B" into another similar plastic container.



Pour Part "B" into Part "A" container. You should have a bit more epoxy resin than you need for your cast.



Add in your choice of colour to the "A" "B" mixture.



**Stir together the resin and colour until thoroughly mixed. Remember, the more mixing you do, the more air you add to the epoxy mixture.**



**Pour epoxy resin mixture into the container with the large screw inserted into the bottom side of the container. Make sure there is plenty of room in the container to hold up to 5 times the volume of your epoxy resin.**



**Place the container containing the epoxy resin into the desiccator chamber and secure the lid.**



**Turn on the vacuum pump and start to evacuate the air out of the desiccator containing the epoxy resin.**



**The air bubbles in the epoxy resin will begin to expand and the level of the epoxy resin in the container will begin to rise. The epoxy will expand until the air trapped in the resin reaches the surface and the bubbles break. Once the epoxy reaches its maximum expansion height in the container, it will start to recede back to its starting level. It is important to have a large enough container to contain the expanding resin or else it will overflow the container. The amount of time the resin can spend inside the vacuum will vary with the type of epoxy resin and the volume used. The type of resin we use can only stay in the vacuum for approximately 13min. Due to the short time the container can stay in the vacuum, not all the air will be evacuated from the resin during this time, but all the air bubbles left in the resin will have risen to the top portion of the epoxy in the container while the lower 9/10ths of the epoxy will be essentially bubble free.**



**Position your container containing the epoxy resin above the pour spout of your mold and remove the screw from the bottom of the container.**



**The epoxy will flow into the mold. Make sure the epoxy that flows through the hole is from the bottom of the mixture. Fill up the mold and replace the screw. You should have some resin left in the container. This resin contains the air bubbles that were left in the top portion of the epoxy when it was removed from the desiccator chamber. At this point you may want to remove your screw and clean it off. Tilt the container so the remaining epoxy will not flow out the hole. If you do not remove the screw, it will harden to the remaining epoxy in the container and you may not be able to recover it to use again.**



Tap the sides of the mold to make sure no air bubbles were trapped while it was pouring into the mold. You can leave your cast to cure or if you have a pressure tank, you can place the mold into the cast iron chamber, supporting the mold so it will not tip over.



Replace the lid on the pressure tank and secure it down with the bolts.



Slowly introduce compressed air into the tank until you reach your desired pressure. Any bubbles left in your epoxy resin will shrink under the increased pressure inside the tank. So if bubbles are present, they will be reduced in size and easier to patch. Once you have reached the desired pressure turn the valve off and disconnect the pressure hose and allow the epoxy to cure.



We usually increase the pressure to 40 psi. But the amount of pressure can vary depending on the type of mold used and cast made.

Note: be aware that any air bubbles trapped in your molding compound will also be shrunk and may cause distortion in your mold

causing a distorted cast. When increasing the pressure in the tank, add the air slowly. If you let the air in quickly it may blow hard enough inside the tank to dislodge the mold, tipping it over on its side or it may blow straight down into your mold and blow the epoxy out of your mold.



When the epoxy has cured, open your mold and take out your cast hopefully bubble free or if not, with a minimum amount of bubbles.