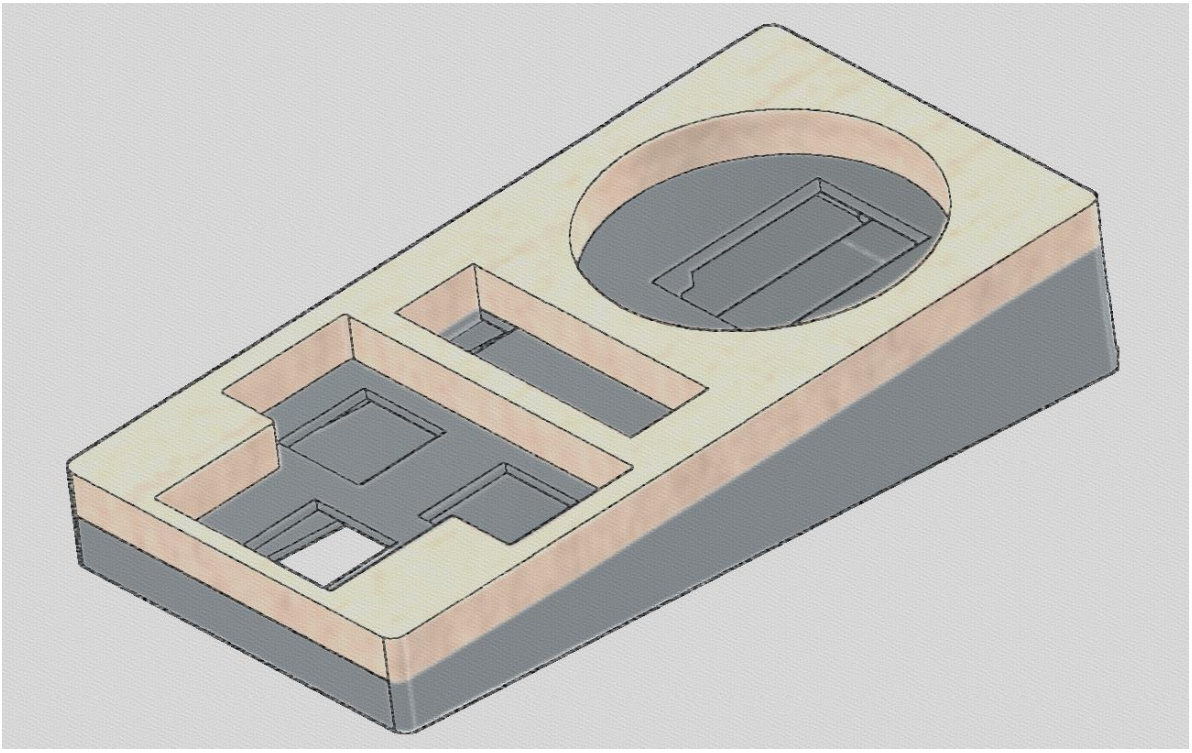
Béton3 // Build Guide

Appendix B: Casting a Concrete Knob

Welcome to Appendix B: Casting a Concrete Knob. This quick guide will guide you through the process of casting a concrete knob using cement, sand, water, and the three 3D-printed mold components.



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Overview of Materials

Before casting a concrete knob, you'll need the following materials and parts:

1. Cement
2. Sand
3. Water
4. Vaseline (Petroleum Jelly)
5. Sturdy Tape (Gorilla Tape, Duct Tape, or Electrical Tape)
6. 2x 3D-Printed Mold Side
7. 1x 3D-Printed Mold Bottom
8. A cup or bowl for mixing concrete
9. A spoon to mix and scoop concrete.

Prep Work for the Mold & Video Example

First, you'll want to assemble the 3-part mold.

The mold is fairly self-explanatory to put together. The two sides are the most difficult part – the spiral embossing on the side wall only aligns one way.

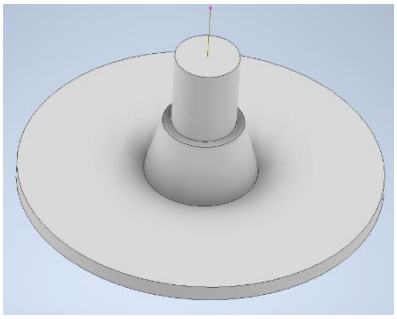

Figure 1 The bottom part of the mold

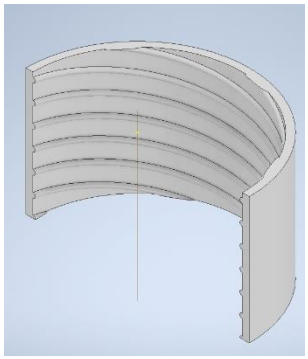

Figure 2 One of two sides of the mold

Use tape to tape the sides together to create a circular ring.

The final step entails taping the ring down on top of the bottom mold part, to create the full mold cavity. You'll want to tape the ring around the full way around, making a 360 degree seal along the bottom edge of the mold.

Finally, use some petroleum jelly (Vaseline) to lightly coat all of the inner surfaces of the mold. This step will make it much easier to separate the mold pieces from the concrete itself.

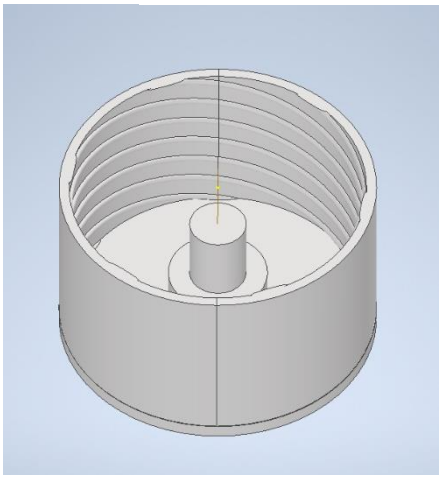

Figure 3 An example of what the completed mold will look like

Mixing Cement

In order to create the concrete mix, you'll want to mix 1 part cement and 1 part sand in a small cup. Two tablespoons of each should be plenty. Easily the most difficult part of this process is the amount of water to add to the sand-cement mix – depending on the type of cement you have, this amount may differ.

I would highly recommend adding a drop of water at a time to get the mix just right.

This video by DIY Perks, while a very different process, is the basis that I used for my concrete mix consistency.

Pouring Concrete

Once you have your concrete mix ready, it's time to cast the knob itself.

Like the previous step, I recommend watching this video by DIY Perks to get a feel for the actual pouring.

I would recommend using a spoon to slowly fill in the mold, bit by bit, tapping the side of the mold intermittently to level out the mixture.

Once the mold is full, you can do several finishing steps – if you just want a smooth, even top surface, tap the mold a few times to level everything out.

You can also take a small dollup of leftover concrete mix and drop it anywhere on the top of the drying concrete, without tapping the mold, to create a grippy, natural looking nub on the resultant knob.

Depending on the cement you used, the cure time will be different, but it should be cured within a general window of 1-4 hours.

Extracting from the Mold

Once the knob is cured, the last step is to extract the knob from the mold.

First, without applying much pressure on the concrete itself, peel all the tape off that is holding the three pieces of the mold together.

You'll want to start with the mold sides. Use the lip at the top edge of each side piece to lightly peel one side at a time – these pieces should come off without too much effort.

Finally, the bottom piece – depending on the quality of your 3D-printed mold piece, this piece may be affixed somewhat tightly to the knob, but it can be pried off. Assuming that the bottom piece doesn't simply fall off, a safe bet is to start with a knife, guitar pick, or credit card to wedge in between the concrete knob itself and the actual bottom mold piece, to get a little bit of leverage and create a small gap.

Once you have a small gap between the concrete and the bottom plate, you'll want to grab the concrete knob in one hand and use your other hand to rock the remaining mold piece back and forth, pulling outwards.

Eventually, the bottom piece will pop out with enough leverage and enough rocking.

Congratulations! You have cast a concrete rotary encoder knob!