

Casting Using Dental Plaster

In my opinion, these are the absolute best casting materials to use.

There are several kinds of dental plaster so whatever you buy, always look at the **compression strength** measured in psi (pounds per square inch).

Regular plaster of Paris is **5,000 psi** compression strength and will chip fairly easily.

Hydrocal is around **8,000 psi** and is much more durable.

Excalibur and **Die-Keen** dental plasters are **18,000 psi** and dry so hard it's almost like a ceramic material.



Excalibur is made by a company called Gerrico. You can purchase it from **Clint Sales** at www.clintsales.com. They don't have an online shopping cart, but you can call them at **(978) 927-3010** or send them an e-mail at cindy@clintsales.com. They ship using UPS Ground and you should receive your plaster within a week. **Die-Keen** is manufactured by a company called Heraeus Kulzer and you can find a list of places that carry it at the Heraeus Kulzer main site.

These two products are almost identical, only the makers of **Excalibur** have made their product specifically for out hobby, so they're offering is at a cheaper price, cheaper shipping cost, and in the colors of **white, tan, and gray!** It doesn't matter which color you pick, they all have the same properties. I found that the **tan or white colors take stain very well** for the wooden plank and wood shingle pieces.

Excalibur cost me \$45.00 for a 50 pound box, and the **shipping cost was only \$9.00**. The Die-Keen was more expensive (from \$56 to \$74), and the shipping can cost up to \$20 depending on how far away they have to ship it.

Is the higher compression strength worth the money? For projects that need to withstand constant handling, I think so. Maybe the instructions here will help you decide for yourself.



You mix this material just like you mix plaster. The Excalibur I'm using is light gray in color (and fairly heavy). Start with a 1/3 cup of water and gently shake (sift) the powder into the water. It will sink quickly.

Continue to add the powder until the water won't soak up any more. If all of the powder is wet and there's no layer of water on top, then you've mixed it perfectly.

Gently stir the mixture to remove any lumps. I swear, dentists have the best stuff. The material mixes smoother than any type of plaster I've ever worked with.





Spoon the mixture into each pocket of the mold. Sometimes it helps to pour the blocks 1/2 way, **tap the mold sharply** to remove air bubbles (I use the handle of my putty knife), then fill them the rest of the way.

Even mixed at full strength, this material is thinner than plaster and will flow into the corners easier. **Be sure to overfill each pocket.**

Let the stuff set in the mold for about **3-6 minutes**. Take a putty knife and poke at the edge. If the edge is the consistency of toothpaste, then go onto the next step.

This material doesn't act like plaster! As the mixture sets, wet particles continue to sink down into the mold, leaving a layer of water on top. The edges around the blocks will start to set up but the **middle of the blocks will still be very liquid.**



Lay a paper towel over the mold and let it soak up the excess water that rises to the top.

This is why you want to overfill the pockets slightly. If you don't, when you soak it up the excess water your blocks will be short.



Gently **scrape across the mold** to remove the excess. The mixture will be thin, so you may have to scrape back and forth a few times to level it.

The excess won't come off neatly. Let it run off the side of the mold onto your work surface. Once it hardens it will pop right off the work surface easily. **Let it set 25-30 minutes** before you remove the blocks.

The dental plaster is **really strong!** I threw a stair section on the floor as hard as I could and it didn't even chip! It also takes glue and paint really well.

Here's comparing the advantages and disadvantages of Excalibur and Die Keen. Overall I was really pleased with the results and will be using these for most of my casting.

Advantages

- **It's Incredibly Strong.** I haven't seen a material as strong as this (except in plastic). The downside is that it's harder to sand and carve.
- **It's Mixes Thinner.** At least thinner than most plasters I've used. This gives you less air bubbles.
- **It cures as quickly as plaster.** A lot of Hydrocal and hydrostone mixtures take longer.
- **It takes paint and glue better than plaster.**

Disadvantages

- **It's Heavy.** Plaster blocks weighing 1 pound would weigh 1 1/2 pounds using this material.
- **It's more expensive** than other plasters. A 50lb box of Excalibur cost me \$45 and the shipping was \$9. Die-Keen was more expensive.