

Homemade Clays

Don't have the backing of Mitsubishi scientists to create your own clays? No worries! Now you can DIY your own clays.

First let's briefly take a look at what PMC actually is and how it works. As many of you know already, it's made up of tiny particles of metal mixed with non-toxic organic binders which burn away during the firing process. The purpose of the binders is of course to 'bind' the small metal particles together before fusion. The materials used for the binders are one of the key elements in allowing the clay to retain its form and shape, in other words it 'sticks' it all together.

The size of the particles are important too, typically around 25nm. The reason for the size of the particles being important is that the smaller the particles (and gaps between the particles) the stronger the fused metal will be. Silver PMC3 has less shrinkage than normal PMC because not only are the particles smaller but the 'gaps' left between each of the particles are filled with even smaller particles making the bond stronger and the spaces between the particles less. This gives less shrinkage during firing because there is less binder (mass) between particles to be burnt out. According to one reference, it uses three different sizes of particles. Hence PMC3!

So what's in the binders? My research on the web has led me to discover that the binders used are derived from starch, (in particular, flaked food grade starch according to one source... think Cornflakes here). Which make them 'organic and non-toxic' which is obviously a bit of good marketing. This is our clue to beginning DIY clay making and the bit that gets us all thinking. Starch's come in many forms and qualities but it is also found in common kitchen foods such as plain flour, corn flour and if my science teacher has done his job....I think I can still remember that it is found in icing sugars too!am I whetting your appetite yet!

Another ingredient in the binder is 'gum'. My guess and only a guess at the moment, is that the gum used is something like Gum Acacia or Tragacanth, which are glues that have traditionally been used by gold and silversmiths and equally 'organic'.

Also there is mention of oils; Lavender seems popular as a paste recipe. However I suspect that Lavender is used just because it smells nice and is popular with lady jewellers! Any kind of oil such as Olive, Cornflower or similar oils will be ok to use if their source is organic and you wish to keep your recipe as 'environmentally friendly' as possible. The purpose of the oil is probably to stop the clay from drying out too quickly and helps to make it pliable.

OK, so if we understand the mechanics of how the clay works, we can lead on from there and here comes the fun part! I wanted to experiment making my own clay as I am sure you will too!

The main ingredients for your recipe to get you started will be;

- Plain Flour
- Cornflower
- Icing Sugar
- Olive Oil
- Water

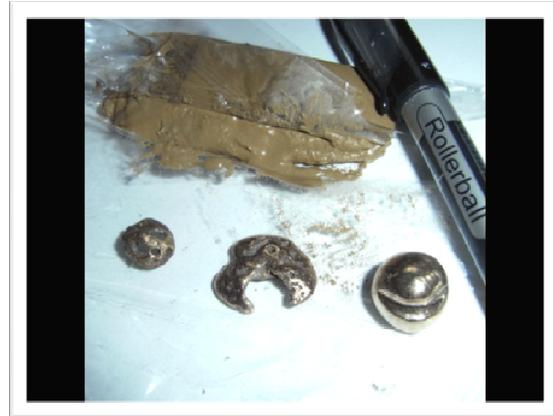
For a fairly successful bronze clay I used

- 4 tspns bronze powder
- 4 tspns plain flour
- 1 tspns cornflower
- one or two drops of olive oil
(level teaspoons)

Mix the dry ingredients together thoroughly and add the oil. (You might not want to add the oil the first time around as you can easily end up with a slippery groggy mess if you overdo it). Add in small quantities of water (some suggest a water sprayer for the dry powder type of clays such as Silversmiths Clay from the USA) and keep adding and mixing until it forms clay of the right

consistency for you! What we have basically made is a DIY form of 'Play-doh' with metal powder added. You may also wish to add warm water as it will affect the way that the Cornflower behaves in the mixture. Using Self-Raising flour might be interesting in forming 'Aero' like forms and you might want to experiment with this by adding Baking Soda to your plain flour.

On the right is a picture of the clay and also some pieces I torch fired.



The Bronze clay recipe can sometimes be torch fired depending on the thickness of the piece you are firing. How this works without using coconut shell is a bit of a mystery...which I only stumbled upon because of my eagerness to try out if my research had paid off! I think that probably the small amount of icing sugar is causing enough carbon to help the sintering process.

The method for firing I've been using is 'experience' which is hard to quantify but in main, bring the piece gently up to temperature as with normal PMC...hold the temp when the binders start to burn away. ie by removing the torch flame, then adding it again until all the binder has burnt away....then zap it with the hottest flame you can get until the surface starts to slightly shimmer and eddy. As it starts to shimmer, keep moving the torch to control the temp at shimmering level....I repeat this process about three times, letting the piece slightly cool to a dull orange....then repeat the process again bringing it up to shimmer. Turning the piece over will also help make a good fusion if the piece has been laying on a flat soldering block or charcoal.....ah..Think I may have just discovered why it torch fires....it's probably not the icing sugar but the charcoal soldering block I fired it on that's causing enough de-oxidation!

Of course the reason why we need to use something like coconut shell is to stop the particles from oxidising too much which stops them from fusing together properly. Although I've yet to try it, adding a touch of Borax BP from the chemist might help 'flux' the particles and reduce oxidization.

I am sure you will devise your own recipes and I hope that you do but I also hope I have given you enough info and pointers to be able to experiment and realise that PMC is not beyond the scope of the kitchen table!

Happy creating and experimenting!

Del Feast

Biography of Del Feast

Metalwork, designing and photography have been important themes that have run throughout Del's career. His background is in electrical and mechanical engineering where in his spare time he would use the factory's equipment to make jewellery. In 1976 he worked briefly for a manufacturing jewellers based in Fulham. He then followed a career in sales and marketing and it wasn't until he took a degree in the Fine Arts some years later, after running his own graphics business, that the interest in jewellery was re-kindled and his knowledge of engineering could be matched with his creative skills. Del now enjoys jewellery making as a leisurely hobby interest and with the advent of metal clays, is now pursuing new creative avenues and exploring its unique properties, which he says is helping him keep his interest in designing and making alive.