

get to grips with METAL CLAY

Silver and gold metal clays have been available to the public since the mid-1990s. Developed in Japan, two brands emerged and are the main source of silver and gold clay today. Over the years, other forms of metal clay have also been developed and this guide covers all of them.

What is Metal Clay?

All metal clays consist of the same basic ingredients: fine particles of metal, a binder and water. They can be worked in the same way as ceramic clays - rolled, formed, textured and cut. When the water is allowed to evaporate and the dry piece is fired, the binder burns away and leaves a solid metal object.

There are three main working stages for all varieties of metal clay:

- The wet or malleable stage where it can be rolled out, textured, cut and moulded.
- The dry stage where it can be filed, carved, drilled, refined or added to.
- The fired stage when it can be drilled, hammered and worked the same as metal.

At the dry stage - sometimes referred to as leather hard, plaster hard or green ware - fine silver clay pieces are very fragile and can break easily. Some of the base metal clays (bronze, copper etc) and sterling silver clay have some flexibility in the dry stage and are more robust.

During the working stages the clay loses first water, and then binder so there is a certain amount of shrinkage in the final object and the amount is dependent on the clay type.



Firing Overview

The process by which the object becomes a solid metal item during firing is called sintering. Sintering occurs below the melting point of the metal and involves the object being fired at the right temperature for a specific length of time. During the firing process, each molecule of metal fuses to those around it creating a solid metal item with integrity and strength. Firing time and temperature depends on a number of variables including the type of clay used, the size and thickness of the pieces and the wearability requirements of the end product.

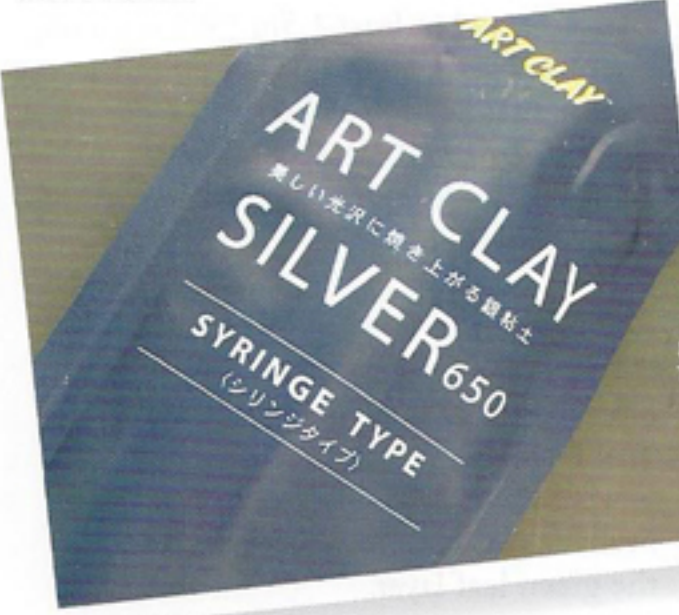
Generally speaking, torch or gas stove firing fine silver metal clay for three minutes or more is sufficient for small, light objects like earrings, pendants and charms. Items will be strongest if they are fired in a programmable kiln for the maximum time and temperature recommended which is 900°C for two hours. This kiln firing schedule has been shown to produce maximum strength in fine silver jewellery which will be subjected to heavier wear such as bracelets and rings. Many metal clay artists fire their fine silver jewellery using this firing schedule so that they know it is very strong.

Other metal clays - bronze, copper, sterling silver and steel - require specialist firing in a kiln buried in activated carbon to exclude oxygen and ensure proper sintering. Small pieces

made using some brands of copper can be torch fired but require steps to be taken to avoid losing texture detail due to oxidation.

Fine Silver Metal Clay

There are two main brands of fine silver metal clay; Precious Metal Clay (PMC) manufactured by Mitsubishi Materials Corporation and Art Clay Silver manufactured by Aida Chemicals. The clay comes in a variety of forms: lump clay, paste or slip, syringe and a PMC sheet form.



Art Clay Silver

Art Clay Silver lump clay used to come in three varieties, Art Clay Original Formula, Art Clay 650 and Art Clay 650 Slow Dry. A new formula was launched in 2013 which combines the working properties of Original Formula, the low firing temperatures of 650 and the longer working times of Slow Dry. This new formula clay has been very well received by Art Clay users. Art Clay

Original Formula, Art Clay 650 and Slow Dry are not being produced any more although you can still buy them from some suppliers while stocks last.

Art Clay Silver shrinks at around 8-9% and can be fired using a gas torch, a gas stove or kiln. With a torch or gas stove, firing time is around three minutes.

Lump clay pack sizes available for retail sale are 7g, 10g, 20g and 50g. Syringe comes in 5g or 10g packs, paste comes in 10g and 20g pots.

Art Clay also has two other products with specific uses. Overlay Paste is used to add silver to glazed ceramic or glass surfaces. Oil Paste is designed to stick fired silver clay pieces together or to fill cracks in fired pieces.



PMC

Precious Metal Clay or PMC lump clay is available in two main varieties, PMC+ and PMC3. PMC Original was discontinued in 2013 but it can still be bought from some retailers while stock lasts. The Original formula had to be fired in a kiln at 900°C for two hours and shrank by around 30%. This made it particularly useful for making small, highly detailed pieces and many serious metal clay artists used it extensively.

PMC+ was the second generation of fine silver clay and PMC3 the third. PMC+ has a good working time and comes in lump clay pack sizes 6g, 18g, 28g and 45g and PMC+ Paper/Sheet in 5g packs either square or long. It shrinks by around 15% and can be fired by torch or gas stove (for 10 minutes or more), or in a kiln.

PMC3 is a low firing temperature clay and fires with a gas torch, a gas stove or kiln. Torch and gas stove firing time is around three minutes and the shrinkage is around 12-15%.

Lump clay pack sizes are 6.3g, 9g, 16g, 25g and 50g. Paste comes in 15g pots, syringe in 9g packs.

Noble Clay Silver

In 2012, Polish inventor Marcin Wojcik of Noble Clay launched Noble Clay Silver Dust and Clay. The Silver Dust comes in a powder form and requires mixing before use and the Silver Clay is usable right out of the package.

Firing is by gas torch or kiln and the shrinkage depends on the firing time and temperature.

Shrinkage is between 13% and 20% with longer and hotter firing resulting in the greatest degree of shrinkage.

Pack sizes for Dust and Clay are 4g, 8g, 15g and 25g.

Sterling Silver Metal Clay

Mitsubishi launched PMC Sterling in the USA in December 2011 and it became officially available in the UK in 2013. It is a mixture of silver and copper which makes it stronger than fine silver so it's perfect for rings and bangles. It has a long working time in the wet stage, retains some flexibility in the dry stage and carves beautifully. Many artists who have been working with fine silver metal clay are now working almost exclusively in Sterling Clay. Shrinkage is 15%-20% - package sizes are 25g and 50g.

Noble Clay Sterling Silver

In 2013, Noble Clay introduced a Sterling Silver Clay in package sizes of 4g, 8g, 15g and 25g. There is little information available about this clay at the time of writing and testing is underway.

Origami by Satoko Parsons with PMC paper clay.



Firing Sterling Silver Clay

The firing of Sterling Silver Clay is trickier than fine silver clay. Because Sterling Clay contains copper, it needs to be fired in an oxygen free environment to ensure proper sintering. To achieve this, firing takes place in a container - normally stainless steel - filled with activated carbon before being placed in a kiln. There are several schools of thought about the firing of PMC Sterling. Some artists maintain that the binder should be burned out in an open shelf firing before burying the piece in carbon for the final firing. Others use a single stage firing buried in carbon.

American artist and teacher Celie Fago has done extensive testing of PMC Sterling and found the following firing schedule gives consistently good results:

First step, open shelf - ramp kiln at 426°C to 538°C and hold for 45 minutes.

Second step, transfer pieces to a stainless steel pan containing 10mm activated coconut carbon, cover the pieces with another 10mm carbon, put a stainless steel lid on the pan. Full ramp to 815°C, hold for one hour.

If you are going to work with Sterling Silver Clay, make some test pieces and develop a firing schedule which works for you using Celie Fago's schedule as a starting point. *continued over*



PMC Pro

PMC Pro was launched by Mitsubishi in 2010. It is 90% silver together with copper and tin making it very strong and perfect for rings and bangles. In the UK, this is not very popular because it cannot be hallmarked, making it problematic for artists selling their work. It is available from limited suppliers and comes in packs of 25g and 50g. Firing in activated carbon is required and it shrinks by 15-20%.

Gold Metal Clay

Both Art Clay and PMC have a Gold Clay version. PMC Gold Clay is 22 carat, shrinks by 12% and is a yellow gold colour. It can be torch or kiln fired and comes in 3g and 10g pack sizes. Art Clay Gold Clay is also 22 carat yellow gold, shrinks by 15% and comes in 3g pack size. Art Clay Gold has to be fired in the kiln at 990°C for an hour.

Hallmarking

Both Art Clay Silver and PMC fine silver clays are hallmark quality once fired. They are hallmarked 999 meaning they have 999 particles of silver per 1000. This level of purity means that fine silver tarnishes less than Sterling Silver Clay and it is perfect for enamelling as there is no oxidation created in the enamel process.

PMC Sterling Clay is hallmarked 925 and this is widely recognised by consumers as a standard for silver jewellery. Gold metal clay is also hallmark quality once fired. **E**

SEEMORE

Next issue we will be looking at more of the metal clays available, including Copper and Bronze clays.

Julia Rai is an award winning jeweller and one of the most experienced metal clay teachers in the UK. She is co-director of the Cornwall School of Art Craft and Jewellery. www.csacj.co.uk



'Pearl Earrings' by Julia Rai, metal clay and enamel, 1st Place, British Bead Awards 2011.



Noticeboard: Events

DECEMBER

13th-15th December

Handmade Christmas Fair, The O2 London. The Cornwall School of Art, Craft and Jewellery will be exhibiting on stand 184. For more details visit www.csacj.co.uk or call 01208 264155.

JANUARY

Sunday 19th January

Sussex Beadwork Fair, The South of England Centre, Ardingly, West Sussex RH17 6TL 10am-4pm www.beadwork.net

FEBRUARY/MARCH

28th February-2nd March

Tickets call 08444 771000. For more details visit www.make-it.org.uk

Sunday 16th March

The Kent Bead Fair, Ashford International Hotel, 10am-4pm www.westofenglandevents.co.uk

Big Bead Show

Dates for your diary

Next year's shows are
Saturday April 5th and
Saturday October 18th 2014

Sandown Park, Esher,
Surrey, KT10 9AJ

www.thebigbeadshow.co.uk

APRIL

Sunday 13th April

The Somerset Bead Fair, Holiday Inn Hotel Taunton, 10am-4pm. www.westofenglandevents.co.uk

Your Event Here

If you'd like your event details to appear in our new-look listings column please email maria@ashdown.co.uk or ring us on 01903 884988.

www.beadmagazine.co.uk

