

Working with Polymer Clay

Basics

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Equipment and working environment

The most popular polymer clay brands used by polymer clay artists worldwide are FIMO® (by Staedler, Germany), Kato Polyclay (by Van Aken, USA) and Premo! Sculpey (by Polyform, USA).

The properties of each of these brands differ both in uncured and cured state. There is no „best“ clay – all brands have their very own advantages and disadvantages. If you like to dive deeper into polymer clay as an art medium you should try all brands side by side to find out your personal preference.



All clays need to be well conditioned in order to mix up the ingredients evenly. Properly conditioned clay ensures finished pieces that are strong and durable. Poorly conditioned clay leads to brittle pieces that break very easily.

FIMO® soft, classic and effekt

FIMO® soft is very soft and thus easy to condition. After proper curing FIMO® soft is firm but tends to lose stability over time. The colors darken a bit during the curing process.

FIMO® classic in its uncured state is firmer than FIMO® soft. This makes the conditioning process somewhat more time consuming. Because of the firmer consistency FIMO classic is the better option for caning. After proper curing FIMO® classic is very durable and slightly flexible. FIMO® effekt clays are translucent, glow in the dark, glitters and the metallic/mica colors.

Pardo Clay

The most recently developed clay brand on the market is Pardo Clay by Viva Decor, Germany. In its raw state the clay is rather soft and doesn't need much conditioning. This property however makes the clay less suitable for caning techniques.

Pardo Professional Art-Clay

This newest clay by Viva Decor was developed in collaboration with the German polymer clay guild „Polyclay-kunst.de“. This clay is firm but quite easy to condition. It's a very good choice for caning techniques and it reduces very easily. Pardo Professional Art clay cures without discoloration. It comes in 14 colors and 5 different mica shades. The reclosable packaging comes in very handy for storing.



Kato Polyclay

Kato polyclay is the result of a collaboration between the reknown polymer clay artist Donna Kato and Van Aken International. With her long experience as a polymer clay artist Donna Kato was able to create a clay which features the most important properties in one clay brand. Kato Clay in his current formulation is easy to condition and it is the hardest and most durable clay after curing. It comes in 17 different shades that can be mixed together to all the colors in the rainbow.

Premo! Sculpey

Aside from Premo! Sculpey, the American company Polyform also manufactures a few more clay brands for diverse applications (i.e. Sculpey III und Sculpey Ultralight). Premo! Sculpey comes in 48 colors and is an easy to condition clay. After curing it's firm and slightly flexible.

Liquid Polymer Clays

Most of the manufacturers offer also a liquid variation of polymer clay. All liquid clays have very similar properties.

Translucent Liquid Sculpey is milky in its raw state but clears up a bit with curing. It's the least translucent but the hardest liquid clay on the market.

FIMO® liquid Deko Gel is also a bit milky and cures to a translucent, rubber-like finish which makes it nearly impossible to sand after curing.

Kato Clear Medium is a liquid clay which – especially after an additional treatment with a heat gun - cures to a nearly glass-like finish that can be sanded and buffed.

Work Surface

As polymer clay may chemically react with the surface of your work table it's a good idea to use a dedicated work surface. This can be a glass sheet, a flat tile, a marble plate or plexi glass. Glass or plexi have an advantage: You can place a sheet of graphic paper below the work surface as a guide for measuring and cutting.

Ovens

The curing temperature of polymer clay is quite low compared to the curing temperature of natural clay. Depending on the clay brand polymer clay cures between 110 and 160°C – temperatures that can be reached by any standard kitchen oven.

Polymer clay is not toxic if properly cured. Only if fired at high temperatures (over 165°C) polymer clay is burning up and releases toxic fumes. Burning can be easily prevented by using an oven thermometer to constantly check the curing temperature.

Should a burning occur to you please switch off the oven, open a window and leave the room until all the fumes are gone.

A suitable alternative to your kitchen oven are small, compact toaster ovens. Unfortunately most of these ovens don't keep the set temperature very well. They constantly heat up and cool down – it's more or less a circling around a set temperature. To prevent that you can place a ceramic tile into the oven which stores the heat and prevents temperature spikes. If you use a toaster oven, the oven thermometer is definitely a must have!

Equipment and working environment

It does not require large investments on basic equipment to start working with polymer clay. A pasta machine, a smooth, unstructured work surface, a craft knife and some tissue blades, an acrylic roller and an oven thermometer is enough to start.



Pasta machine

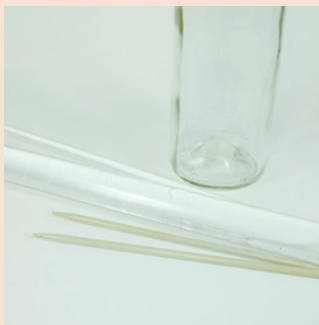
A good pasta machine is indispensable when working with polymer clay. There are several different manufacturers, and the best quality is to be found among the Italian brands such as Marcato (models Atlas, ampia) or Imperia (each around 40 Euro). Cheaper pasta machines (from the supermarket - around 10 Euro) are ok to get started, but in the long run, if you decide to really dive into crea-



ting with polymer clay, the more expensive pasta machines are the safer bet. Their gears are made of steel, and not - like in the cheaper models - from soft cast iron, which wears out very quickly. All pasta machines have multiple Thickness settings (usually from 1-7 or 1-9).

The clay sheets that you feed through your pasta machine should be just slightly thicker than the preset distance between the rollers, otherwise the construction of the pasta machine could be damaged.

Cleaning the pasta machine is best done with baby wipes or with an alcohol soaked paper towel. Clay remnants below the rollers can be removed gently with a wooden stick (metal can damage the rollers or other important parts, such as the scrapers).



Tools for rolling and smoothing

An acrylic roller (alternatives: a cylindrical glass or a glass bottle) is used to roll out thicker clay sheets, to reduce canes or to smooth surfaces. Thicker knitting needles can also be used for smoothing and leveling clay surfaces.



Cutting

Using sharp blades, polymer clay can be cut in uncured and cured state. The standard equipment includes a craft knife or scalpel (for detailed, small incisions), a rigid blade (to trim clay blocks and thicker sheets) and a flexible blade, which is particularly suitable for cutting curved shapes and in techniques such as Mokume Nendo .

Also metal cookie cutters come in very handy to cut out shapes.



Stamping and texturing

Rubber stamps, texture plates and many household items can be used for texturing polymer clay. To prevent the clay from sticking to the stamp you can use a release agent like water or cornstarch. Stamps should be cleaned thoroughly after use with polymer clay since the plasticizer in the clay can damage the rubber.



Extruding tools (Clay Gun)

An extruder is similar to a pastry press. The conditioned clay is loaded into the barrel and squeezed out by pressing it through a die disc. There are several manufacturers of extrusion tools. The one that is really easy to handle is the "Ultimate Clay Extruder" from the Makin's. Unlike the lower-cost, simple variants, this one has a screw handle which makes it very easy to press the clay out.

Safety note:

To prevent cuts always mark the blunt edge of your clay blade to avoid holding it the wrong way.

Extreme caution is advised when working with these very sharp cutting tools.

Equipment and working environment



Punching and drilling

To pierce holes into your clay (to attach your pieces to a cord or wire) you will need a small selection of hand drills and needle tools. Clay can be drilled either in uncured or cured state.



Sanding and polishing

After hardening, polymer clay has a dull, slightly uneven surface. To achieve a smooth, glossy finish, you can sand your project with wet sanding paper in ascending grits (400 up to 2000 grit). Afterwards the clay can be polished by hand on a soft cotton cloth or with a buffer.



Adhesives

Superglue is very well suited to glue polymer clay to rubber, buna, plastic etc. Epoxy glues or silicone-based adhesives attach polymer clay to metal and glass. To get clay to stick to already cured clay you can use liquid clay or Lisa Pavelka's heat resistant superglue Polybonder.



Pliers

To connect jewelry parts and accessories to the finished polymer clay piece, you need a small selection of pliers. Standard equipment includes round nose pliers, long nose pliers, a wire cutter and a crimping tool for closing crimp beads and tubes. Very handy but not absolutely necessary are pliers to open split rings.



Paints, inks and pigment powders

Acrylic paint, alcohol inks and pigment or metallic powder can easily be applied to polymer clay (both on raw or already cured clay). Oil paints are also suitable for use with polymer clay. Metallic- and pigment powders can be stamped on the clay or spread with your fingertips or a brush. Liquid clay can be tinted with oil paints and powders. Also oil pastels or crayons and colored pencils can achieve wonderful effects.



Varnish

Your clay pieces can be finished with a coat of glossy or matte varnish to protect them from contamination and superficial damage. Sanded and polished parts retain their luster in the long run, if they are sealed with a lacquer. Varnish is also a good sealant for surface treatments like powders, metal leaf or transfers. Unfortunately, not every varnish is working well with polymer clay. Some may turn yellow over time or become sticky.

Most clay manufacturers offer a varnish to go with their clay. Varnishes can be mixed with pigments or mica powders, to achieve special effects.



Metal leaf

In order to achieve convincing metallic effects you can combine metal leaf with the uncured polymer clay. Metal leaf is available in gold, silver, copper and it also comes in patterns. Metal leaf needs to be varnished or coated with a very thin layer of translucent clay to prevent flaking. Genuine gold leaf and silver are a bit more expensive, but they don't oxidize over time like the "fake" version.



Release agents

Release agents are used to prevent the clay from sticking to stamps, texture plates, molds or cookie cutters. Depending on the project water, cornstarch, baby powder, Armor All or Kato Repel Gel can be used. Water is the only release agent that does not change the properties of the clay (i.e. if you mix the scraps after texturing the clay with a stamp).

Safety note:

Polymer Clay is generally safe and non toxic. However, all tools and utensils that you use with the clay should stay on the clay table and should not be reused for food preparation.

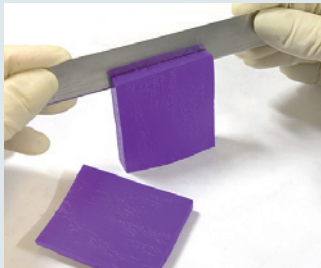
Conditioning

Conditioning means to mix all the ingredients in the clay evenly together. Proper conditioning prevents

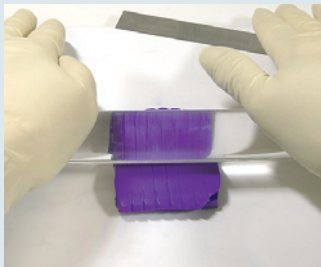
air bubbles in the clay and ensures that the piece is strong and flexible after curing.

Poorly conditioned clay can be brittle and weak after hardening. You can condition the clay either by hand (which carries the risk of re-incorporating air into the clay) or with the help of the pasta machine.

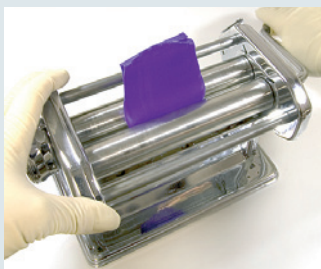
Old and crumbly clay can be smoothed with a few drops of mineral oil (use sparingly), or with liquid clays.



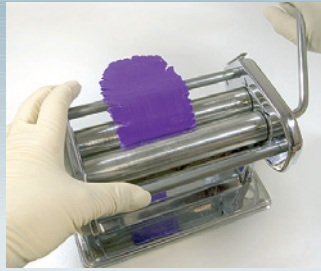
1. Using a rigid blade cut the clay block into slices of approx 5mm (1/8").



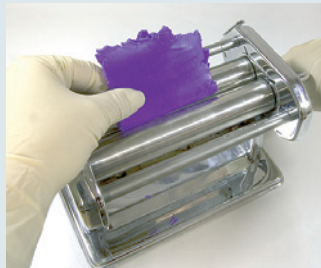
2. Stack these slices and roll them with the acrylic roller by using a bit of pressure (it's best to stand up and do it) to about 5mm (1/8") thickness. This minimizes the risk that the sides of the clay fray when rolled through the pasta machine.



3. Now roll the clay through the thickest setting of your pasta machine. Reset the pasta machine to a medium thickness (#3) and roll through again.



4. Now fold the clay and roll it through on the same setting. Always feed the clay through the machine with the fold touching the rollers in order to prevent air getting trapped in between the sheet.



5. Fold the clay again and run it through the pasta machine a second time.



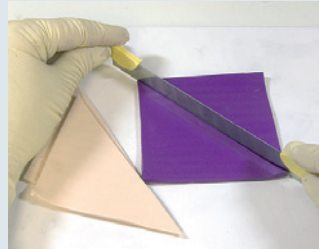
6. Repeat folding and rolling 10-15 times until the clay is soft and pliable.

Skinner Blends

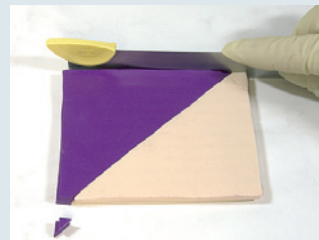
Gradients can add more depth and interest to your projects and patterns. The American artist Judith Skinner has developed a quick and easy way to achieve a nice and even gradient with two or more colors.



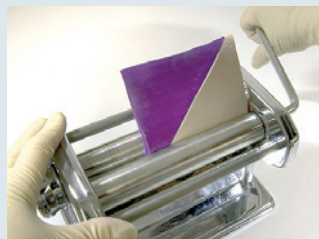
1. Condition clay in two contrasting colors and roll them through the widest setting of your pasta machine. Cut both sheets into equal squares.



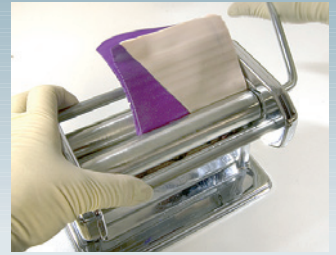
2. Now cut the squares diagonally into triangles. Stack the equally colored triangles and form a two colored square like shown in the picture below. Press the seam together.



3. Note that the corners of the triangles don't meet up exactly. Trim these tiny triangles with your blade. The slight offset ensures that you'll end up with a gradient that still features the original colors on the left and on the right side of the blended sheet.



4. Now roll the square through the pasta machine on the thickest setting. Make sure that both colors touch the

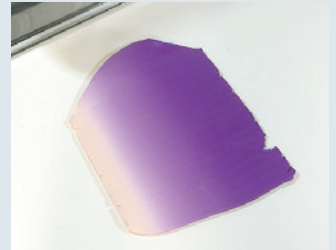


rollers.

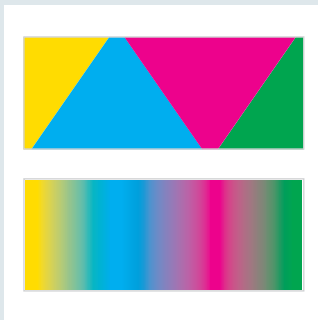
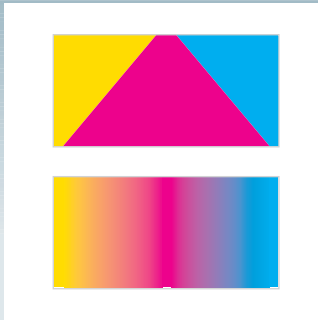
5. Fold the sheet so that two edges of the same color meet. Place the fold on the rollers and roll through again.



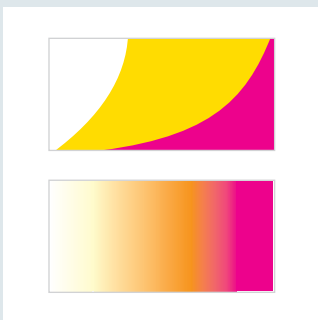
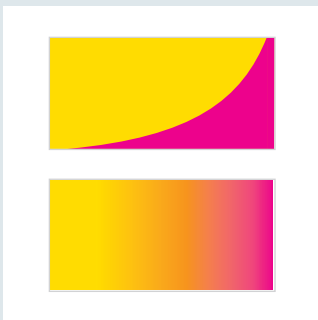
6. Repeat this process 20 to 30 times, until the two colors are evenly blended.



Skinner Blends



To create a gradient with more than two colors all you need to do is adjust your layout a little bit



You can also make adjustments in color proportions (i.e. if you blend a light color with a very pigmented color).

Curing and Storing Finishing

Curing

Under the influence of heat the PVC particles in the clay polymerize with the plasticizers. It is very important to cure the clay according to the manufacturer's specifications. Properly cured clay is very strong and durable. The curing specifications vary with the clay brand you use.

A FIMO® sheet of 5 mm thickness cures in 30 minutes at 110 °C. Cured at 130 °C FIMO ® is less brittle and more flexible. Pardo Clay and Premo! have to be baked at 130 °C, Pardo Professional Art Clay at 120-125 °C. Kato Clay, however, should be cured at 150 °C and a sheet of 5 mm thickness only needs 10 minutes of curing time.

In order to prevent a burning of the clay, I strongly recommend an oven thermometer and alarm clock to frequently check curing time and temperature.

Even properly cured clay evaporates and the fumes settle down on the surface on the inside of your oven. If you use that same oven to prepare food you may likely be using higher temperatures than 160°C which causes these settlements to burn. To be on the safe side I strongly advise to build some kind of "curing chamber" (eg two superposed aluminum trays, or a concealable, transparent casserole) to bake your clay in.

In order to prevent shiny spots on your piece, you can put it on a piece of paper/cardboard, or - if your piece is not flat - on cotton, fiber fill or in a bed of cornstarch or baking soda.

Storage

The curing process of polymer clay starts at about 30 °C. so always keep your clay in a cool and as dark spot (the heat of direct sunlight is not to be underestimated).

Raw clay can easily be stored in plastic wrap or bags, aluminum foil, or screw-top cans. Some types of plastics may chemically react with the clay and are not suitable for clay storage. Most plastic containers are marked on the bottom with a recycling symbol (three arrows arranged in a circle with a number in the middle). All containers with a number 5 are safe and don't react with the clay.

Sometimes the difference between a high quality piece of jewelry and a rather mediocre piece only shows in what kind of finish it has experienced. Is the surface smooth and even, or are there still visible dents or fingerprints? Are the edges sharp and defined? If you want to create a high quality piece of jewelry for a gallery or a competition, a good finish is a must.

Some pieces benefit from a matte or textured surface and working accurately and exactly will do the trick. Other pieces, however, only come to life if they feature a smooth, shiny satin or high gloss surface finish that only can be achieved by sanding and buffing.

Sanding

Sanding may be the most unpopular step in the creating process. At least for me it is.

It is time-consuming and exhausting, but in regard to the end result extremely rewarding. Nothing is more beautiful than a shiny, glossy and glass like artist bead.



Beads by Kerstin Rupprecht

There are simple tips to reduce sanding time tremendously:

- Always work with latex or vinyl gloves to avoid unwelcome fingerprints on the workpieces.
- Dust the raw clay with corn starch - this facilitates smoothing the clay surface a lot. You can apply the corn starch with a big brush. Please remember, that corn starch is also a release agent and raw clay won't stick to a dusted surface any more. You can wash off the corn starch with warm, soapy water after curing.

To prevent the inhalation of sanding dust you should always wet-sand your pieces or, if wet sanding is not possible, wear a dust mask.

I wet sand in a bowl with water where I add a drop of dish washing detergent. The detergent reduces the surface tension of the water and the sandpaper doesn't clog as easily. Just wet your sandpaper and sand in uniform motion with light to medium pressure.

Depending on the piece you may want to start at a 400 grit and work your way through the grits up to 1000 for a satin shine or to 2000 (or even higher) for a high shine.

To achieve an optimal sanding effect you should not skip grits. Once you're happy with your result you can go on with polishing/buffing your piece.

Buffing



For a satin finish I always buff my pieces either on my leg (Jeans) or with a soft cotton cloth.

To achieve a high gloss and glass-like shine you need to use a buffer or a hand-tool (eg Dremel/Proxxon) with a soft buffing wheel.

Only use light pressure during the buffing process. Don't press too hard. The friction generates heat which can cause ugly ridges in your piece. If that happens you will have to resand the piece.

I made the polishing wheel on my Dremel (picture above) by stitching together 5-10 cut out circles from a soft cloth.