

LA MERIDIANA

INTERNATIONAL SCHOOL OF CERAMIC ART IN TUSCANY



Notes on paperclay

INTRODUCTION

In the past centuries ceramic techniques have always developed and adjusted to new discoveries and ideas, although this has usually happened very slowly. In the last century, however, a real revolution has taken place involving artists, industry and researchers in a large way, multiplying the possibilities for artistic expression enormously.

In the search for new techniques paperclay is a most interesting invention that opens up new possibilities in the arts.

Paperclay is a mixture of clay and paper pulp or vegetable fibre. This mixture has characteristics that make it very different from normal clay. It's lighter when the cellulose is burnt away; it's stronger both at leather hard and bone dry state; it breaks with more difficulty and it repairs with ease; fresh clay can be joined to bone dry clay or even to biscuit ware !

Clay reinforced with cellulose is an excellent material for big pieces, sculptures and slabs because in a raw state it's very strong and after firing it's lighter in weight.

The use of paperclay is economical. All types of waste paper, recycled paper and pulp are good materials for mixing with the clay. The clay will go further since the fibre from paper added to the clay will add to the bulk of the body of clay. Paperclay is also very resistant to rapid temperature changes. This means shorter firing with consequent energy savings.

To work with paperclay also seems more spontaneous than with conventional clays. Paperclay allows for fast drying without cracking or deformation. Big and thin objects can be glazed raw and fired even if they are still wet.

Paperclay helps to remove many traditional constrictions and presents only one big disadvantage in the fact that after firing resistance to breakage is reduced in proportion to the amount of pulp present in the recipe.

CELLULOSE

Cellulose fibre molecules are made in the shape of small tubes and offer an efficient, flexible and resilient way for the plants to feed from water and minerals.

Paper appears under a microscope as a compressed tangle of tubular cellulose fibre dried in the form of a sheet. These resilient small tubes of cellulose can easily undergo compression, stretching and abrasion. In fact, it's very difficult to destroy cellulose and this is the reason why paper can be recycled so many times.

In clay, these small tubes carry water through the whole mass of the clay and they help to dry the piece uniformly as if they were drinking straws that transport water very quickly from one place to another.

The thin molecular structure of the cellulose doesn't interfere with the clay structure but offers incredible flexibility in the manipulation of the clay.

With a minimum of 10% in volume of pulp to clay we get the typical characteristics of paperclay. Higher percentages are used for medium to big work in order to facilitate the work and make the objects even lighter.

We can use percentages even higher than 30% but in this case clay should be vitrified in the firing, otherwise the body could become too fragile.

PREPARATION AND USE

If we add torn paper to warm water and stir vigorously, the paper will break down to a soft pulp of cellulose fibre.

There are two fundamental types of paper with which to start: toilet paper if we are in a hurry or news paper if we have more time. Non-patinated paper and egg cartons could be alternative sources. We take a bucket and fill it up to $\frac{3}{4}$ with warm or hot water and add 2-3 rolls of toilet paper. After 1-2 hours, using a mixer will produce the paper in pulp. If we use newspaper we can fill up the bucket up to $\frac{1}{3}$ with stripes of torn paper and fill to $\frac{3}{4}$ with warm water. Wait for 1-2 days and stir it with the mixer.

Many varieties of paper are suitable for the production of pulp to be used in the paperclay making. Every paper will have slightly different types of cellulose.

Stir the paper with the water to a point where the whole thing looks like a watery slop. When the break down of the cellulose is completed, the floating pulp will give the idea of clouds and it will be soft at the touch like wet cotton. If, at a certain point, stirring doesn't dissolve any more paper, try to add some more warm water.

In some cases, even when you have these soft clouds and no evidence of small parts of broken paper, small holes can be noticed after firing. This means there were whole pieces of paper left in the clay leaving holes behind when they burnt in the firing. The best paperclays are those that have no visible cavities produced by fired paper.

Do not leave the pulp in water for more than a few days otherwise mould and a smell will develop. If you are thinking of using the pulp over one or two weeks, add some mild disinfectant (not bleach) to the pulp. This addition although it will not eliminate the problem but it will delay the deterioration of the fibre considerably.

With your hands squeeze the water out of the pulp to a consistency of soft potato mash. If necessary keep the pulp in sealed plastic bags.

Pulps derived from different types of paper can be mixed only after the separation of the cellulose. From the clay prepare a slip of the same consistency as the pulp.

After having decided the proportions, prepare the volumes and mix them in a large container. Mix the pulp and the slip as uniformly as possible. The main reason for using the slip is to be able to enclose every minimum particle of cellulose with a thin layer of clay. The mix is then spread out and left to dry to the point of the desired consistency before being kneaded.

As already mentioned if we want to use the paperclay over a period of one or two weeks we must remember that cellulose after a few days, depending on the climate, will begin to rot turning the clay dark. The small vegetable tubes start to break down and the paperclay goes back to ordinary clay.

A very good solution is that of cutting the paperclay in slabs and letting it go bone dry. When dry, the cellulose doesn't rot and consequently will not develop bad odour. When needed you can then wrap it in a wet towel. The tubular structure will take the water through the mass slowly and gently. Within 5-10 minutes the paperclay will be perfectly plastic and will be usable immediately.

FIRING

All paperclays should be biscuit fired very slowly to 350-400°C in order to give time for the cellulose to burn out completely and then up to a minimum temperature of 1000°C where a soak of about 30 minutes should take place.

Low temperature paperclays (900-1150°C) should not contain more than 30% of pulp since they do not vitrify.

Paperclays for high temperatures (1150°C and more) can include a bigger percentage of pulp but must be vitrified.

Generally speaking paperclays retain all the firing properties of original clay.

Personal recipes

Most clays are suitable to be transformed into paperclays.

Personal formulation of paperclay will permit a further control over preferences and variables such as: material availability, pre-determined goals, surface characteristics, workability, workshop tools, firing temperature, kilns, climatic conditions, etc.

In order to make a granulous paperclay add chamotte, sand or other non plastic materials to the recipe. Paperclay for sculpture can use a big quantity of particles and fillers of various dimensions in the same way as for conventional clays,.

Slip casting properties are retained and if the paper is sufficiently broken down paperclay can be used for throwing as long as the turning process is kept to a minimum.

CONSIDERATIONS

The easiest way to grasp the real advantages of paperclay is to make a series of sticks or strips, leave them to dry completely and use some paperclay slip to stick them together. The technique of dry to dry is ideal for a country with a very hot and dry climate. Conditions like these allow for a fast drying both before and after the joining. You'll need only 10 seconds for a join since the dry paperclay will rapidly suck in the humidity. Joins done in this way are as strong as the paperclay itself both before and after firing.

If part of the piece is not to your satisfaction it can be changed at any stage. Perhaps the biggest potential of paperclay is in its resistance when dry and in this capacity of joining with such ease. Surface details have become increasingly important. With conventional clays most surfaces are easily ruined in the manipulation of the soft clay. Paperclay allows the making of different textures that will not be damaged when the single parts are assembled together in the final work.

Paperclay increases the number of construction techniques, it widens the vocabulary of ceramic art and therefore also the interest for clay as an art medium.

LA MERIDIANA

International School of Ceramic Art in Tuscany

Loc.Bagnano 135 50052 Certaldo (FI) ITALY

www.lameridiana.fi.it Tel 0571 660084 info@lameridiana.fi.it