

# GUIDE: RECYCLING CLAY

An integral part of pottery studio maintenance is recycling scrap clay. While forming a lump of clay into a finished and fired ceramic piece, clay *scrap* is produced in each stage of the process. This excess clay can be recycled and re-used over and over again until it is *fired* in a kiln, allowing you to stretch resources, reduce the amount of waste your studio produces and keep defined working areas of the studio organized. You may also find that knowledge gained from fully utilizing clay in all its forms increases both skill and creativity.

You can recycle small amounts of clay as you go, or wait to collect a large amount of scrap and recycle it in big batches. Your available equipment, studio size and the volume of clay you go through will determine which method is best for your pottery studio.

Many open or collaborative studios use a single type of clay body so that high-temperature and low-temp clays or white and red clay bodies don't get accidentally mixed together to produce undesired results in firings. If multiple clay bodies are used in your studio, care should be taken to store and label different clays separately at all stages of making and recycling, including keeping separate wash and slip buckets and plaster slabs and thoroughly cleaning pottery wheel trays and clay mixers before switching clays.

We typically think of clay as moist, semi-solid and malleable – this is called *wet* or *workable* clay (the stage at which clay is most commonly formed into pottery and recycled). However, clay also exists in a *leather-hard* stage (solid, easily handled and carved), as a liquid *slip*, as a *bone dry* (brittle) *greenware*, as a milled powder, and in a fired *ceramic* stage. Recycling is possible in all stages but the fired ceramic stage.

## Wet/Plastic Clay - Forming Stage

Recycling at the wet clay stage is easily done in small batches as you go. However, when wet clay scrap is combined, air can become trapped inside which can cause blow-outs during firings. *Wedging* (a process similar to kneading dough) compresses and removes air bubbles from clay. Store wet clay scrap in plastic bags or sealed totes until you are ready to wedge. Clay will eventually dry out (even in plastic), so don't wait more than a few weeks. Watch a video tutorial on spiral and ram's head wedging methods!

**To Wedge Clay:** Use a wire cutting tool to slice the clay, and if the clay is a little dry, add thick clay slip between each layer. If clay is too wet, form it into an arch to increase surface area and speed air drying. To wedge, press the clay down and forward onto itself (do not trap air by folding the clay over). Pull the clay back towards you and twist the lump of clay slightly onto the table before repeated pressing. You can also throw clay down hard on the wedging table to compress it and pop air bubbles. Use a plastic scraper to remove sticky clay from the table surface and continue wedging and slicing and adding more slip as needed until the clay is a consistent texture and soft, but not sticky.

### You Will Need:

Wedging Table  
Plastic bags or totes with lids  
Wire cutting tool  
Flexible plastic scraper

## Clay Slip - Throwing/Forming/Mixing Stage

During wheel-turning, clay slip helps hands glide across the surface of the vessel. It is created when water mixes with the outer layer of clay to create a slippery mud. Slip is also created any time water is added to bone dry clay. Clay slip should be sponged up while cleaning and collected in buckets for later recycling. Pouring slip through wire screen over buckets will prevent tools from getting lost in slip buckets and mistakenly sent through your clay mixer.

**To Mix Slip:** You can use a drill with a large stirring *Jiffy* bit (commonly used for paint or concrete mixing) to stir the slip and get a smooth consistency. Eventually the heavy clay material will separate and sink to the bottom of the bucket, leaving plain water at the top. Clay slip can be stored for several weeks in this state, though if stored too long, bacteria and mold may form and produce a strong odor. Water can be drawn off the top of the bucket with ladles, cups, a large syringe (turkey baster) or sponges. A few drops of bleach can also be added to help prevent mold overgrowth.

### You Will Need:

5 gallon bucket  
Drill with Jiffy mixing bit  
Turkey baster/large syringe  
A few drops of bleach

**To Dry Slip in Canvas:** Some potters pour clay slip in canvas bags or slings to dry into workable clay. The canvas allows water to evaporate through the breathable fabric until the clay is wedging consistency. After removing clay from the canvas bags, it will need to be wedged and stored in plastic bags or totes.

### You Will Need:

Canvas bags or slings  
Wedging table

**To Dry Slip on Plaster:** A very common method for small batches of recycling is scooping and thinly spreading clay slip/mud onto a plaster wedging table, thick plaster slab, or canvas topped table to dry. Plaster will quickly pull water away from the clay wherever it touches. After a few minutes use a stiff, but flexible plastic scraper to separate the clay from the table and flip the clay over, back onto the plaster to dry the other side. Monitor the clay as it dries and use a wire tool to slice and wedge the clay until you've reached the right consistency. The smaller your plaster slab or wedging table, the more quickly the plaster will become saturated with water and the longer it will take to dry the clay.

### You Will Need:

Plaster slab or table  
Drill with Jiffy mixing bit  
Flexible plastic scraper  
Wire tool

**To Use Slip to Mix Clay:** Clay slip can also be recycled by adding powdered/milled dry clay to thick clay slip in a clay or industrial bread mixer. Industrial clay mixers allow large quantities of clay to be recycled. You will have to wedge the clay unless you are using a machine called a de-airing pug mill. De-airing pug mills mix, extract air, and extrude clay—producing mechanically-wedged and ready-to-work clay.

### You Will Need:

Clay Mixer, Pug Mill or  
Industrial Bread Mixer and  
Wedging Table  
OR De-Airing Pug Mill

## Other uses for Clay Slip:

**Score-and-Slipping or Sprigging:** Clay slip collected in buckets after wheel turning or slaking is also used for attaching clay to clay (handles, appliqué designs, knobs, etc) at the leather-hard stage. This is done by first using a needle or scoring tool to scratch through both surfaces of the clay to be joined. Thick slip is then added to the scored clay before joining, where it acts like a glue, securing the attachment in a process called *score-and-slipping*. *Sprigging* is another method of joining clay pieces together with slip only. Though sprigging can save time, it creates a less secure join and may require slower drying times to avoid cracking.

**Slip Casting:** If you have plaster molds for forming pottery, you can use recycled clay slip in a process called *slip-cast molding*. Because clay settles, causing water and clay to separate over time, a suspending agent must be added to smooth casting slip before it is poured into molds. Sodium Silicate will keep clay particles in suspension while the slip is in the mold. Be sure to keep casting slip separate from regular clay slip. Research slip-cast pottery to learn more!

**Slip Decoration:** Clay slip can be applied to leather-hard clay to add texture, design or color. Try adding *Mason stains* or mineral colorants like red iron oxide, cobalt, rutile, chromium oxide or copper carbonate to clay slip to achieve colors in your finished wares. Slips are typically applied to leather-hard clay with a brush. They can also be carved through for interesting results. Unglazed slips will have a clay-like finish when fired.

## Leather-Hard - Carving/Trimming Stage

Leather-hard clay is perfect for trimming, carving and attaching handles and spouts. Lots of scrap will be created at this stage. However, leather-hard scrap or trimmings will not wedge or slake easily because clay at this stage still contains physical water, and is not very porous. If leather-hard clay is soft enough to be cut with a wire tool, it can still be added to pug mills with slip. If not, you will need to **COMPLETELY** dry any leather-hard trimmings or rejected pots before you can begin reclaiming them.

Small trimmings will dry into greenware quickly, but larger chunks of clay may take up to a week to fully dry. Use a hammer to bust up large hard scrap into smaller pieces for easier processing. Fans and heat can speed up this process. Kiln rooms and sunny spots will quickly dry leather-hard scrap for recycling.

## Bone Dry/Powder/Greenware - Sanding/Mixing Stage

Once clay is bone dry, it becomes extremely fragile and brittle. It is at this stage that sanding and final smoothing is done before bisque firing. Bone dry clay/greenware is ready to either place in a kiln to create a finished ceramic ware OR to begin processing by slaking.

Clay contains silica which can accumulate in lungs over time if inhaled. Wear a fine particle filter mask when handling greenware or using powdered dry-mix to reduce your risk. Keeping a clean studio can also reduce the amount of dust produced by foot traffic.



**Slaking:** When completely dry clay is added to water, it *slakes* or absorbs water quickly and begins to dissolve and lose its structure. The slaking process turns bone dry clay into clay slip where it can then be mixed, dried and wedged into workable clay.

Powdered/milled clays can be purchased at the same retail clay supply outlets where *wet* clay is purchased. If your studio has a clay mixer or pug-mill, it is helpful to purchase bags of *dry-mix* of your studio clay body. Dry-mixed clays can be mixed with plain water to create workable clay. However, adding the powder to clay slip instead of water means you will use less powder to achieve your clay's desired consistency, which will save your studio money. Clay slip also contains bacteria which helps make clay more *plastic* or malleable.

## Ceramic/Bisque/Glazeware– Glazing/Firing Stage

Clay undergoes chemical changes when heated or fired in a kiln that permanently dry the clay and transform it into a hard, stone-like ceramic material. These chemical changes start occurring around 700 degrees Fahrenheit and complete at around 1650 degrees Fahrenheit. Once clay has been bisque fired or glaze fired, it will no longer slake into clay slip and can no longer be recycled.

Glazing or firing problems can cause defects in finished pottery like cracking or glaze crawling that make the piece unable to hold water or be used for food. However, fired ceramic material with defects may still be suitable in decorative ways. Try repurposing rejects by breaking them into shards for use in mosaic or other creative art constructions. Research mosaics to learn more!

## Final Notes:

Setting up your pottery studio to easily recycle clay will save money, reduce waste and provide lasting rewards. Learning about clay in all its various forms can help both new and experienced potters understand and work within the limits of the material to achieve successful final results. Your studio will begin to flow once various areas and bags, buckets and bins are established for wet clay storage, leather/drying scraps, greenware scraps/slaking, mixing and wedging.

Though at times physically demanding, recycling clay is a tactile experience that has the ability to activate our senses and ground us in a connection to the earth and to ancient potters that harvested and recycled clay to make functional clay vessels long ago.



## Additional Resources:

General Clay Recycling: <https://thepotterywheel.com/how-to-recycle-clay/>

Wedging Methods Video: [https://www.youtube.com/watch?v=cDglUGVLH\\_s](https://www.youtube.com/watch?v=cDglUGVLH_s)

Pouring a Plaster Wedging Table: <https://www.lakesidepottery.com/HTML%20Text/Tips/Making%20Wedging%20Table.htm>

Slip-casting: <https://www.claycraft.co.uk/how-to/slip-casting-for-beginners/>

Decorating with Slip: <https://potterycrafters.com/how-to-make-clay-slip/>

Score and Slipping: <http://flieschool.com/content/two-rules-joining-clay>

Clay Mixers: <https://ceramicartsnetwork.org/daily/article/Six-Key-Considerations-When-Shopping-for-Clay-Mixers-and-Pugmills>

Canvas Bag/Pillowcase Drying Method: <https://potterycrafters.com/recycle-clay/>

Mosaic with Fired Ceramics: <https://www.instructables.com/Recycle-ceramics-into-awesome-Mosaic-stepping-stone/>