

Vince Pitelka, 2016

Soldner Mixer Instructions

The maximum capacity of the Soldner professional mixer is 260 lbs. of dry materials. If you exceed this, your dry materials will end up all over the floor, and/or the mixer will bog down and the thermal overload switch on the motor will repeatedly kick off. If you accidentally put in too much water first, and need to add more than 260 lbs. of dry materials in order to get the right clay consistency, you will have to remove some of the partially mixed clay to avoid overloading the mixer.

Remember that the dry particles added to any claybody continue to absorb water after mixing, causing a corresponding stiffening of the claybody. To counteract this you must mix your clay on the wet side. Softer clay will become wetted more quickly and thoroughly, encouraging bacterial growth, giving a much more plastic claybody. It is worth it to risk clay a little on the soft side. A claybody that is initially mixed stiff will take twice as long to age to an ideal plasticity. Also, as explained below, if you allow the mixer to run for a half hour to an hour after adding the clay, before adding the other materials, you will end up with a much more plastic claybody, as this will wet the clay particles much more thoroughly.

For porcelain, porcelaineous stoneware, and whiteware bodies, always add Epsom salts as specified in the handout "Mixer Load Amounts for Claybodies." As indicated, always dissolve the Epsom salts fully in hot water, and then include that in the specified amount of water for the clay batch.

Mixing Clay from Dry Materials and Water

What to Do about Remaining Residue in the Mixer Tub - If there is significant stiff or bone-dry clay residue left in the mixer from the last batch, scrape down the walls and mixing bars with a wide spatula, and place the scrap in the recycle barrels. Unless you are mixing porcelain or whiteware, do not worry about the fine residue, because it will immediately slake down in the water and blend with your claybody with no impact. If there are accumulations of damp-but-stiff residue in the mixer, scrape from the walls and mixing bars and put them in the recycle barrels.

NOTE: For mixing porcelain and whiteware, see the instructions below.

Add Water to the Mixer Drum First - The finished claybody will contain approximately 20% water. In other words, the amount of water is approximately equal to one fourth of the total dry materials weight. A 5-gallon bucket of water weighs 40 lbs. A batch containing 260 lbs. of dry materials will usually require 60 to 70 pounds of water to achieve soft plastic clay. Weigh your water carefully, and keep track if you need to add additional water during mixing, so that you will know to add more initially the next time. Remember that there is no set amount of water that works for every claybody. Each one different, and adding too much water to begin with causes a lot more trouble than if you add too little and need to add more during mixing. ***If the recipe calls for Epsom salts, dissolve them in hot water, and use that as part of the initial water in the mixer tub.***

If the Concrete Mixer Tub Is Dry - After pouring your water in the mixer, use a sponge or cup to wet down the inside walls thoroughly. This will discourage the clay from sticking to the walls.

Adding The Clays - The challenge with mechanical shear mixers, as compared to mixing a claybody as a slurry and letting it stiffen, is that they do not tend to thoroughly wet the clay particles, and thus you get a less-plastic claybody. The most important particles in this regard are the clays, because they are so much finer in size than the other materials. The best way to compensate for the shortcomings of the Soldner is add all the clays and let the machine run for a half hour to an hour. That will not hurt the machine at all, because it is an easy load.

If the recipe calls for bentonite, Macaloid, or Veegum-T, use the drill-mounted jiffy-mixer or the small hand blender to blend them with some water and a little bit of any of the other clays, and add that after you have added all the other clays.

Start the mixer and the exhaust fan and add the dry clays. For full bags of raw materials, with the mixer running, lay each bag cross-ways on the mixer lid, slit the front edge of the bag horizontally, and rake the materials into the grate opening in the lid. You can rake a full 50-pound bag of materials into the mixer in a minute or so, and it should absorb just fine.

Important! - ***After you have added all the clays let the mixer run for a half hour to 45 minutes to soak all the clay particles before adding additional materials.***

Adding the Other Dry Materials

Begin adding the other dry materials, finest materials first, coarsest materials last. For whichever of the following materials your claybody contains, the correct order after the clays is the powdered non-plastics like feldspar, flint, pyrophyllite, talc, etc., and then finally the sand or grog (including Kyanite or Molochite). Add the materials slowly, and allow them to absorb into the developing mixture.

As the water absorbs the dry materials, initially the mass of very soft clay will rotate in the mixer like a giant doughnut. Once all the dry materials are added and absorbed, the clay should begin to tumble in large, rough chunks. If this does not happen, it means you have added too much water, and your only recourse is to add more dry materials. If you started out with a full mixer load, then you will have to remove some in order to make room for more dry materials.

Adding More Water to the Mix - If you start with insufficient water and add dry materials without carefully monitoring the consistency, at some point the mix will become too stiff, and the mixer will begin to strain. If there is any sign of this, you need to start adding more water or slurry right away, but add it very slowly. For adding water, use the short green hose, and dribble water in extremely slowly over the tumbling clay mass about six inches away from the center pivot. ***Never add water at the center or along the outer edge of the tub.*** Add the equivalent of a few cups of water, let it absorb completely, and then add more.

If you add too much water all at once when the clay is too stiff, it will simply lubricate the inside of the mixer tub, and the tub will spin freely while all the clay remains in one big lump stuck to the mixer bars. If this happens and there is only a little excess water or slurry, just let the mixer run for a few minutes. The moisture will soon be absorbed and the mixer will start working properly again. If there is excessive water or slurry, you will have to add more dry materials to absorb it. If the mixer is already filled close to capacity, you will need to remove some clay before adding more dry materials. The best practice is to simply be very careful not to add excessive water or slurry to the mixer tub after the clay has begun stiffening to plastic consistency.

Note: If the Mixer Shuts Off Automatically – Occasionally, if the mixer is overloaded it will shut off automatically. If this happens and the mixer is not over-full, it is because the clay is too stiff. Dribble a little water over the clay, wait a few minutes, and re-start the mixer. Keep dribbling water in slowly with the mixer running, until the clay reaches the desired consistency. If the mixer shuts off because it is over-filled, remove some clay, wait a few minutes, and re-start the mixer. When the remaining batch is adequately mixed, remove some of that and replace the first portion you removed, add more water if necessary, and finish mixing the batch.

Removing Clay from the Mixer - When the clay is mixed to the desired consistency, remove the loose chunks of clay from the tub. Close the lid, turn on the mixer for a few seconds, shut it off, raise the lid, and remove the loose chunks again. Repeat this until the mixer is almost empty. Use a scraper and your hands to remove the last of the clay from the walls and floor of the tub and from the mixing bars.

Mixer Cleanup - It is not necessary to sponge out the mixer after each use, but you must scrape off all thick deposits of clay from the underside of the lid, from the walls and floor of the tub, and from the mixing bars. Remove all clay scraps the scraps from the mixer except for a thin residue on the walls or mixing bars. Do not leave any large chunks or thick deposits of clay anywhere in the mixer, because these tend to dry slowly, and may produce hard lumps of clay in a subsequent batch.

NOTE: The original instructions that come with the mixer say it's okay to not clean the mixer after use, but in institutional situations that is not acceptable. The only exception is if you know for sure that someone else is mixing a similar claybody right after you. In that case there is no need to clean the mixer. The residual clay will still be soft, and will be easily absorbed into the next batch. Otherwise, you must always clean the mixer as described above.

Mixing Clay from Wet Scrap Recycle and Dry Clay Materials

When mixing clay from wet recycle, be sure to scrape off and remove any thick accumulations of stiff or dry clay from the mixer, because these will not slake down in wet recycle, and will produce hard lumps in your claybody. Put no more than 175 lbs (about three and a half 5-gallon pails) of wet recycle (less if it is quite fluid) in the mixer, start the mixer, and slowly add your pre-mixed dry materials (see below) a little at a time until you get the consistency you want. Watch the consistency carefully, and be prepared to add more water with the hose as described above if it proves necessary. To prepare your dry materials, purchase a half-mixer-load of raw materials,

put them all in the big cardboard drum that is kept in the clay cage for this purpose, clamp on the drum-lid, and roll the drum around on the floor for a bit to thoroughly mix the dry components before slowly adding to the recycle a scoopful at a time. Save any leftover dry-mix for the next batch.

Preparing the Mixer for Mixing Whiteware or Porcelain

The following measures are not necessary for porcelaineous stoneware bodies, but are very important if your objective is a very white porcelain or whiteware. With a scraper, loosen and remove all residue of the previous clay batch. Pour a few gallons of clean water in the mixer tub. With a large sponge, wash down the mixer walls, mixing bars, and the underside of the lid. Use the scraper and/or a stiff brush to remove clay from behind the mixer bars. Use a small bucket or scoop and a sponge to remove all water from the mixer tub. For the whitest claybody, repeat the water-wash at least one more time.

Maintenance

Consult the manufacturer's information for more detailed maintenance instructions. The older professional mixers have a belt drive from the motor to the jackshaft (secondary shaft), that must be carefully monitored and adjusted for belt tension. The newer professional mixers feature a gearmotor that drives the main chain directly with no belts.

Critical Maintenance - The zerk (grease) fittings on the bearings at the top of the main tub shaft and at the bottom under the tub must be greased religiously once a month with a pump-type grease-gun. The main drive chain must be sprayed with aerosol chain-lube once a month.

Failure to keep up with either of these maintenance steps can cause rapid and serious damage to the machine.