



## SilverPrep Natural Pickle Mix

SilverPrep is an all natural non-toxic mix that can be used as a traditional pickle for fine silver, sterling silver, copper and gold.\*

SilverPrep is an alternative to toxic sodium-bisulphate products. SilverPrep is a natural acid (very similar to vinegar, but stronger) mixed with buffering agents that attack copper oxides to clean sterling silver after heating.

### Instructions

SilverPrep can be made in small batches on the stovetop or can be made in a traditional pickle-pot (which is typically a repurposed crock pot).



### Toolbox

Saucepan or pickle-pot

Plastic, copper or stainless steel tongs

### Stovetop Instructions

Put 2 cups of distilled water into the saucepan or pickle-pot and then pour in 3 tablespoons SilverPrep Mix. Stir until dissolved using the wood spoon. Heat on high to boiling. Adjust the heat to maintain a gentle boil. Add parts to be pickled to the boiling pickle. Leave the parts in the mix until they have turned white, which will usually be within 2 to 5 minutes. Some heavily oxidized parts may take longer. Remove and rinse in clear water.

Watch the mixture at all times during heating. Add water as it boils off.

Small parts can be placed in a plastic or stainless steel pickle basket to be retrieved more easily (Item #SOL-107 Stainless Steel Pickle Basket). Small parts can also be strung onto stainless steel binding wire (such as when pickling many jump rings) to make them easy to fish in and out of the pickle.

### Pickle-Pot Mixing Instructions

To 6 cups of water, pour in 1/2 cup SilverPrep Mix. Stir to dissolve. Set temperature on highest setting. Keep the pot covered at all times when not adding or removing items to preserve the water level. Keep a gallon container of water nearby to add as it evaporates.

### Clean-Up & Safety

SilverPrep mixture can be re-used many times. Allow the mixture to cool and store in a plastic food container for future use. Store away from children and pets. When the pickle becomes blue, it is saturated with dissolved copper oxides and it's time to replace it with a fresh batch. The mix can be safely diluted and poured down a drain.



COOL TOOLS

## SilverPrep Depletion Gilding Instructions

Use SilverPrep to depletion gild sterling silver for enameling, reticulation, co-firing, and fusing with fine silver.

By oxidizing and then dissolving away the copper on the outer surface of sterling silver, a skin of pure silver is left. The surface is literally “depleted” of copper. This “gilded” surface is needed for enameling and fusing sterling with fine silver clay, and as a finishing technique to create a brighter, more tarnish-resistant surface.

### 1. Oxidize

Pre-finish your sterling silver parts. Whether you are using a tube bail, prong setting, disc, or hand made part, it may require some cleanup and/or scratch removal. Cast commercial settings often need a good bit of cleanup to make them presentable in jewelry. Die struck settings often have ridges that should be smoothed out with files. Look closely at the sterling silver parts you wish to use and clean them up with files if necessary and then give the pieces a final polish before oxidizing.

**Torch Oxidizing:** Place sterling silver pieces on a soldering board and heat each piece lightly and very carefully until they turn very dark grey. Turn the sterling over using fibergrip tweezers and repeat for the other side. The piece should not glow with heat. Back off if the piece begins to glow red. Allow the pieces to air cool.

**Kiln Oxidizing:** Place sterling silver pieces on kiln shelf, load into the kiln and set your program fast ramp to 1200°F/649°C, hold for 1 hour. Allow the pieces to air cool.

### 2. Pickle

Mix SilverPrep according to instructions. Add your oxidized sterling silver pieces. Leave in the SilverPrep solution until the sterling turns white, which will take from 1 to 5 minutes depending on the size of the pieces. Rinse in clear water.

### 3. Repeat

Now oxidize again. This time, you will find that it's harder to oxidize the surface. This is because a lot of the surface copper has been dissolved away. Do not heat longer or hotter than the first time. You will not be able to get it as dark the second time. Cool and pickle again. For small items such as ear wires and settings, this should be enough. For larger items such as bracelet cuffs, up to 5 rounds may be needed. Keep oxidizing and pickling until you cannot get more oxidation from the metal.



## SilverPrep Natural Pickle Mix

How to properly co-fire sterling silver and fine silver clay.

### Prepare the Metal

Depletion gild your sterling silver with SilverPrep Natural Pickle Mix. Then combine your prepared sterling with fine silver or silver clay in any way you desire.

### Embedding Settings

Stone settings can be pressed directly into wet silver clay or they can be set into bone dry clay. To set into dry clay, use a drill or a stone setting bur to drill a hole large enough for the diameter of the setting. The setting should be a hair larger than the setting being embedded. Keep in mind that the clay will shrink around your embedded object. If the object is not embedded deeply enough, it may be squeezed upward and outward.

### Embedding Wires

**Method 1:** Drill a hole in the dried clay the same diameter as the wire you are embedding. Pick up the end of the wire using wire cutters. Insert the wire into the hole. Fire.

**Method 2:** Use the planishing end of a goldsmithing hammer to flatten the end of the wire that will be embedded in the clay to about 50% of the wires original thickness. Then chomp out the flattened edges with your flush cutters to nick them up. Insert the wire into the damp, but not dry clay so it does not tear but does not distort either.

### Applying Fine Silver Clay to Sterling Silver

Syringe, paste and lump clay can all be applied directly to the sterling and fired in place. Unfired, dried metal clay parts can be “glued” directly onto the sterling with paste or syringe. Metal clay slabs or bits can be applied wet to sterling silver and allowed to dry, then attached with paste and fired.

### Fire

Do not exceed 1 hour or 1200°F/649°C when kiln firing fine silver clay and sterling silver. Firing sterling silver above 1200°F/649°C causes the sterling silver to become brittle.

**Kiln:** Fire your pieces for up to 1 hour at no more than 1200°F/649°C. Allow to air cool.

**Torch:** Fire as normal.

### Finish

We highly recommend tumble finishing because the burnishing action adds additional hardness and does a great job of polishing the sterling silver. After tumbling, your sterling silver will be sparkling and shiny and will resist tarnish longer than untreated sterling silver.

After firing, pickle, rinse and dry, and then burnish the surface by buffing with a brass brush. Load the parts into the tumbler barrel and tumble for 2 hours.

For hand finishing, polish as usual.



COOL TOOLS

## Dead Soft Metal

After firing, fine silver and sterling silver are in a fully annealed state, meaning the metal is in its most ductile or relaxed state (“dead soft” if referring to wire temper). Fully annealed sterling silver is very soft and very easily formed, and fine silver is even softer and easier to form. The annealing temperature for fine silver is 800°F/427°C. Sterling silver ranges between 1100°F/593°C and 1200°F/649°C.

Depending on the piece being made, you may not want the metal to be soft and easily formed. You may want to stiffen the metal up so it's more rigid and durable. This can be done by work hardening or by heat hardening.

## Work Hardening or Cold Working

Sterling silver and fine silver can be made harder by what is called “work hardening” or “cold working”. Both of these terms refer to manipulating the metal to induce hardness. The metal can be twisted, hammered, stretched, or bent to harden to the desired temper.

## Heat Hardening or Precipitation Hardening

For pieces that need to be strong and hard such as rings and bracelets, the sterling silver can be made hard by heat-treating in a kiln after all firing is complete, but before polishing. Heat treating is the way metal is tempered to give it specific properties. The crystal structure of a metal can be altered by what temperature it is heated to, how long it is held there and how fast or slow it is cooled. Fine silver cannot be heat hardened.

### Heat Harden Sterling Silver

Fast ramp to 572°F/300°C / Hold 1 hour  
Remove from kiln. Air cool.  
Finish as desired

Any stone that can survive a kiln or torch firing can withstand the heat hardening schedule. Please refer to our Gemstone Firing Guide for a comprehensive list of gemstones that can be kiln and torch fired.