

## B50: SEE HOW TO MAKE LIME PLASTER

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### WHY USE LIME?

Lime plaster forms a light, clean, and durable surface that is resistant to weather and mold. A thin layer attaches well to walls of earth and other natural materials. Many historic buildings in Europe have been preserved for centuries under lime plaster. Every 4 or 5 years the plaster needs a thin coat of limewash to maintain its strength.

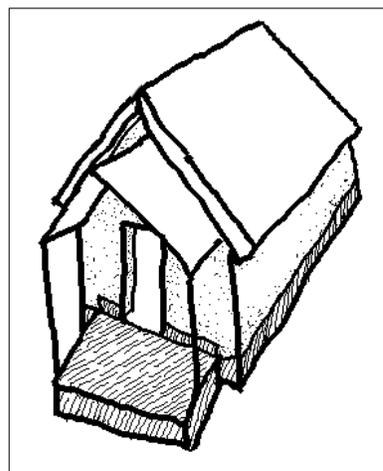
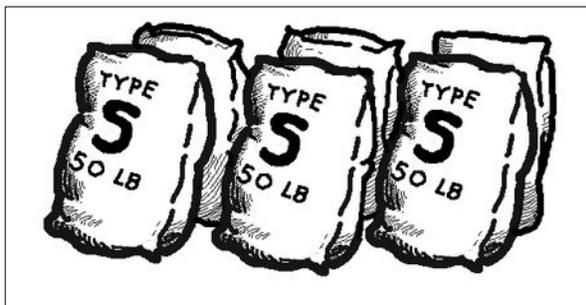
Lime plaster is the best finish to use on earth walls because:

1. It shrinks and swells with heat in a similar way to earth. A thin layer of lime plaster on earth will not suffer serious cracks like cement stucco. It is also easy to repair lime plaster with a thin layer of plaster or limewash.
2. Lime plaster protects walls from rain, but it also allows the walls to dry out. Cement stuccos retain water and can cause serious damage to earth walls in cool climates.

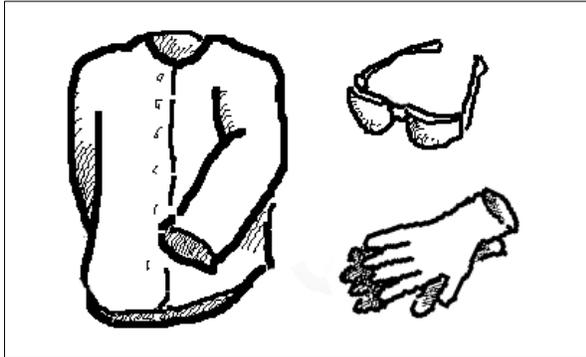
Lime plaster cannot be made with limestone. Only hydraulic builders lime will do. This powder is sold in sealed bags, and labeled “type S” lime. Often a proportion of lime is added to high quality cement, so it can be bought at good masonry yards.

For the exterior walls of a small house - 9' by 12' (2.7 by 3.7 m) a builder needs six 50 lb bags of lime (23 kg). This is enough to make a half inch or 12 mm thick coat of plaster.

If you carefully plaster natural walls with earthen plasters, less lime will be needed as a finish coat. For a thin layer of lime plaster (1/4 inch or 8 mm thick) only three bags or less of lime will be needed.



## STEP 1: HOW TO MAKE LIME PUTTY

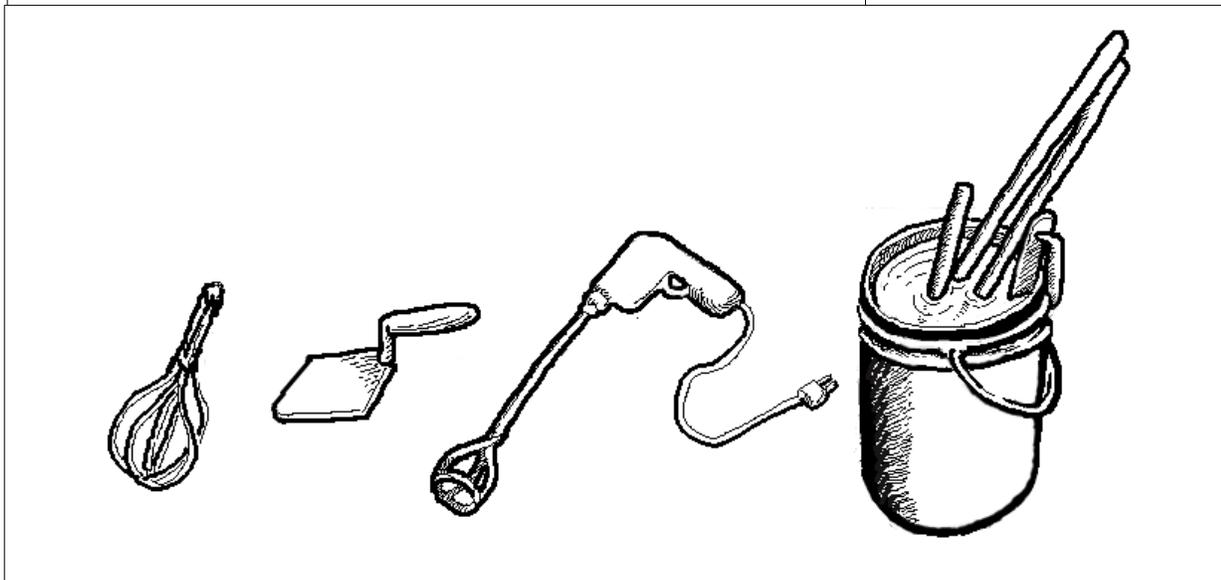


Wear a long-sleeved shirt, glasses, and rubber gloves for mixing.

Pure lime can burn if it stays on skin or eyes.



Keep a wet cloth and some diluted vinegar nearby to remove spots.



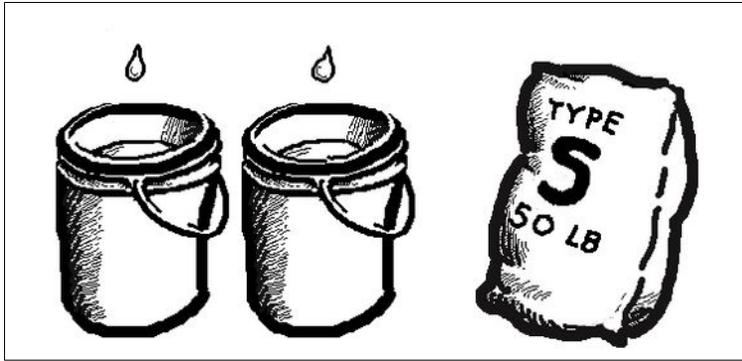
### **Tools:**

Wire whip (like used in cooking)

Trowel

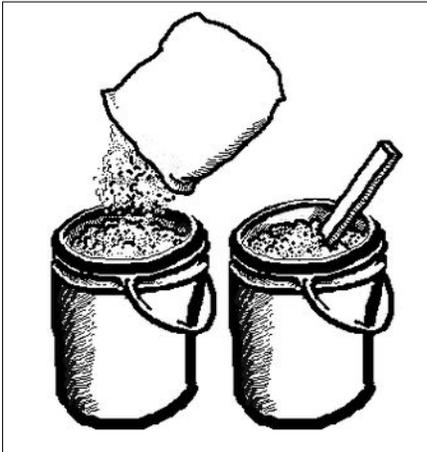
An electric drill with a paint mixing attachment if it is available.

A bucket of water: Keep tools wet until you can clean them.



**Ingredients for Lime Putty:**  
**Two 5 gallon buckets**

**One 50 lb (23 kg) bag of hydraulic type S lime**



Fill the buckets 2/3 full of water.

Open a new sack of lime. Separate the lime into two equal parts. Don't breathe in the powder.

Slowly add the lime to the two buckets. (Never pour water on top of this kind of powdered lime.) Mix it together well.



Wipe and rinse your hands and face often if you get spots of lime on you.

Add a little more water if you need it to mix all the powder in smoothly.

Scrape the sides of the bucket.

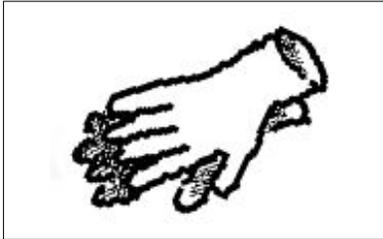
Continue to mix until there is no powder visible, and the putty is a very smooth and thick paste.



Pour a little water on top of the putty and seal it with a lid.

As long as it doesn't freeze, the putty will only improve with time.

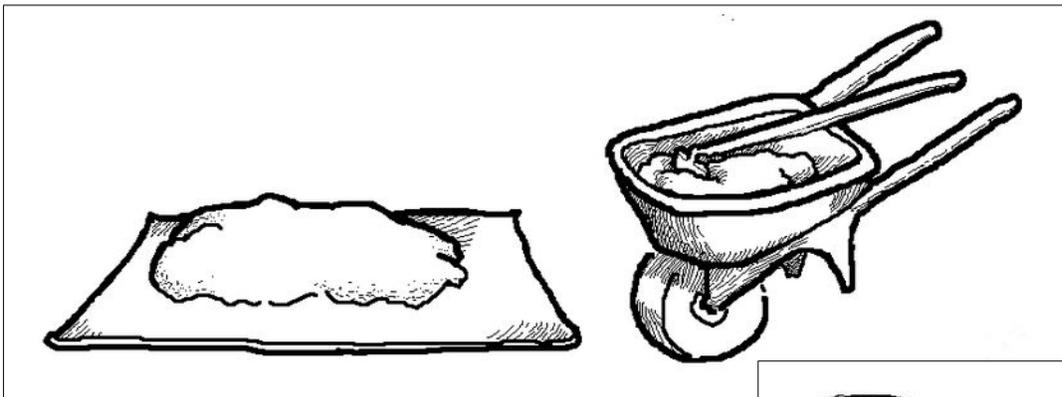
## STEP 2: HOW TO MAKE LIME PLASTER



Lime plaster can also burn you badly if you leave it on your skin for an hour. Use rubber gloves, and wipe off your face, arms and legs often.

You can mix one batch in a wheelbarrow.

Mix larger quantities on a tarp placed in a hole.

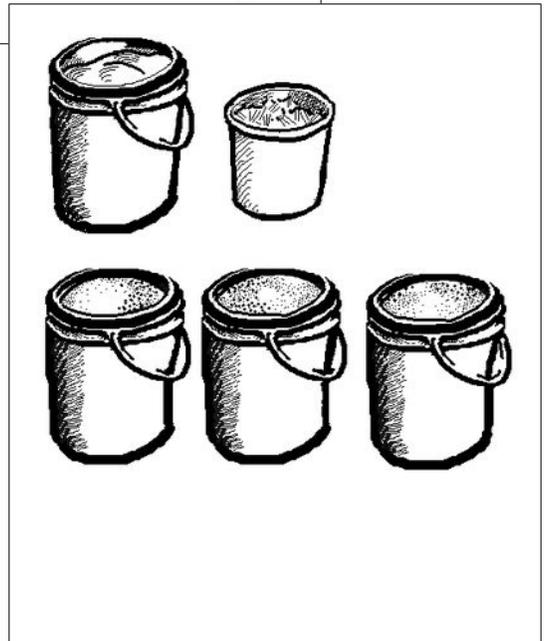


### *Ingredients for Lime Plaster*

*5 gallon bucket of Lime Putty*

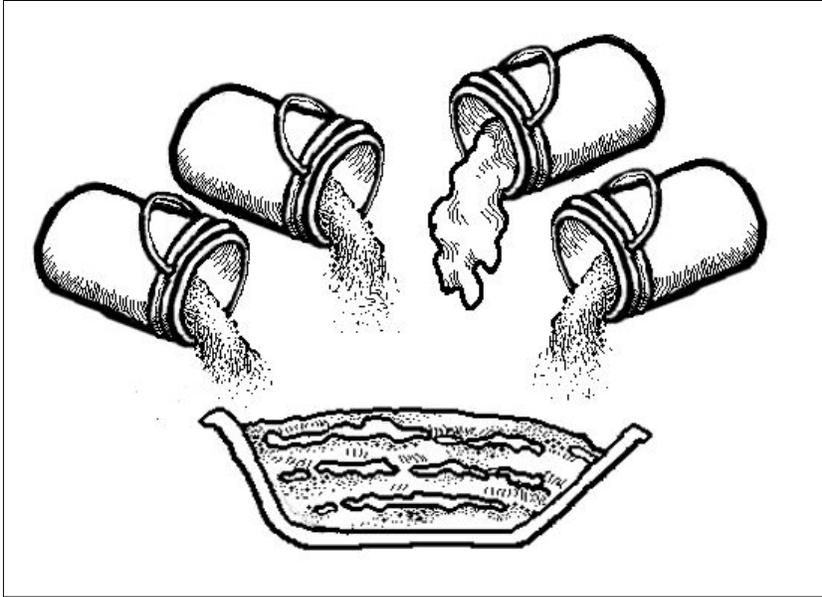
*2 gallons of short fibers*

*Three 5-gallon buckets of sand*



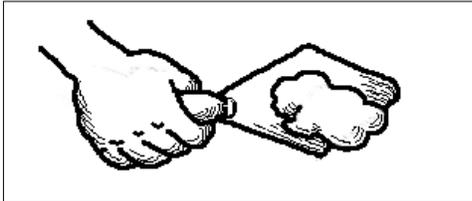
Screen the sand with a window-screen if it contains small stones.

Wash the sand if it contains salt or dirt.

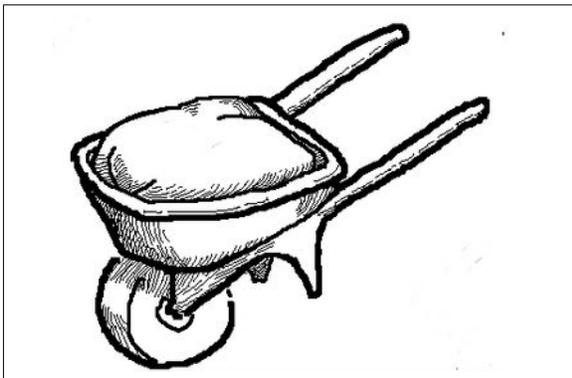


Spread the sand and putty in thin layers. Mix it together well with a hoe.

Add only a little water. All the sand grains should be covered in liquid putty.



The plaster should be more thick than runny. A little should barely hold onto a trowel when it is held vertical.



You can mix lime plaster ahead of time. Cover it and keep it humid under a tarp or in closed buckets.

Fibers give strength to plaster, but should be added at most 2 or 3 days before use.



**Fibers:**

**Manure** fresh and dry (best from horses or donkeys).

**Straw or animal hair** chopped in 2 inch (5 cm) long pieces.

**Cattail heads** look like a brown cigar. They grow in

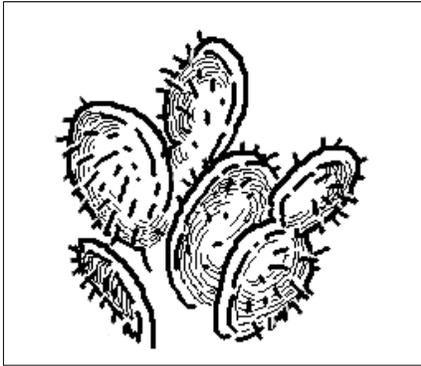
swamps.

Separate the fibers and mix them well into the plaster.

If the sand contains a little clay, prepare the plaster a few days ahead of time.

***Additives:***

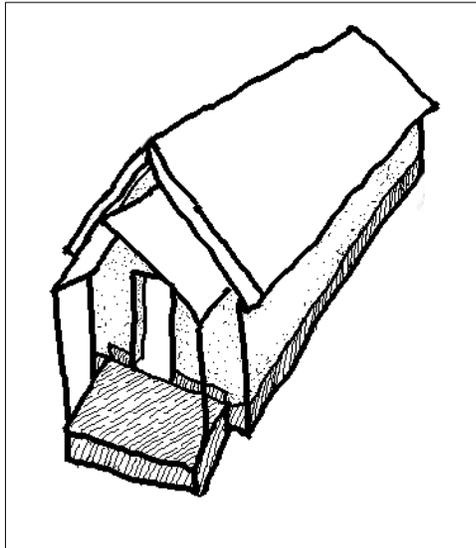
Some people add one quart of boiled wheat paste to each 15 gallons of sand. My lime plaster always is sticky enough without any wheat paste.



The juice of a cactus with flat leaves can help lime plaster resist weather. Chop the leaves of *Opuntia* species (called prickly pear) and cover them with water for 2 weeks. Add the juice to your plaster before the juice begins to ferment.

In some regions, the hydrated lime available is of very poor quality. Plaster made with it will not begin to harden within a day. Instead you can use half Portland cement and half lime in this proportion- 1 part lime putty : 1 part powdered Portland cement : 6 parts sand. This mixed lime and Portland plaster will probably not work in thin layers on natural materials as well as pure lime plaster.

### STEP 3: HOW TO PLASTER WITH LIME

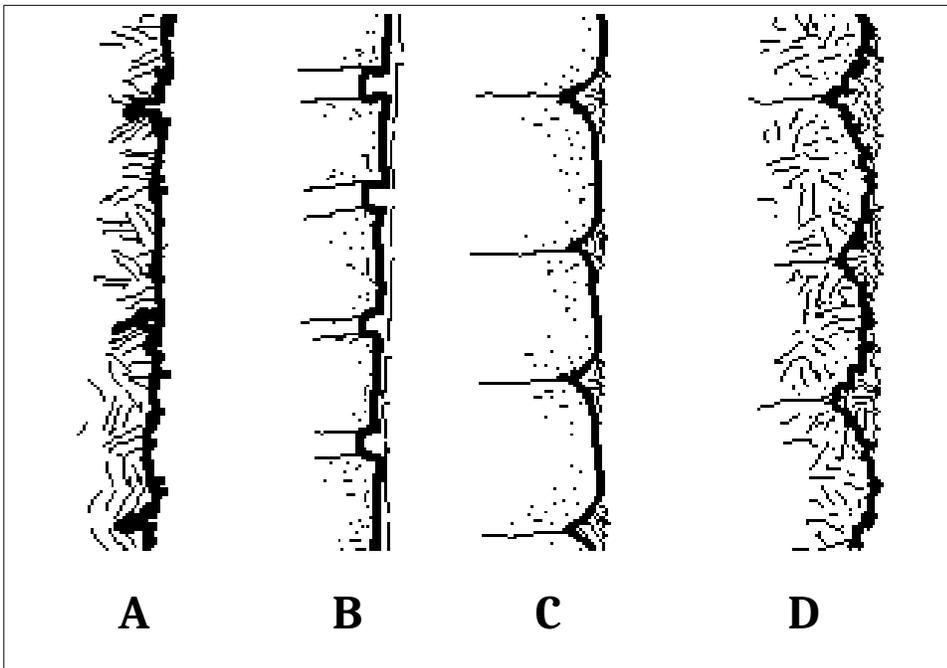


Lime plaster is similar to cement stucco, but can be worked for a full hour. It hardens more slowly.

Use some Portland cement stucco near the ground where the rain will soak the wall often. Lime plaster is long lasting a little above this level, and under a small roof overhang.

Lime plaster sticks well to many walls that have a textured surface. You will use less lime if you level the walls first with an earthen plaster.

#### *Preparing for Lime Plaster :*



**A : Straw bales or Ubuntu blocks made of stems or roots:**

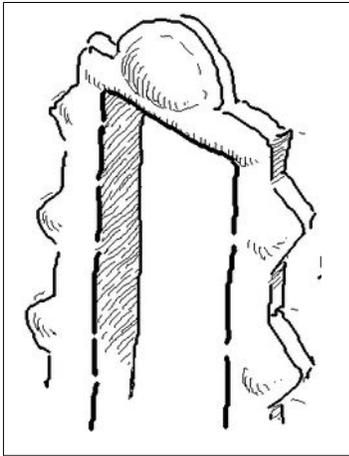
Soak the surface first with a thin clay slip. Fill any holes or dips with an earthen plaster containing straw

**B : Scratch smooth walls** before they dry. If mud block or

compressed earth blocks don't have enough texture, attach some type of mesh (like fish or bird-net) before plastering.

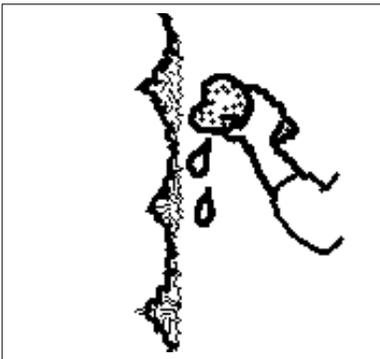
**C : Fill the nooks between layers of earthbag** with a sticky clay plaster. If it contains a lot of straw, it will not crack much.

**D : Level walls of straw wattle or straw clay** using an earthen plaster that contains a lot of straw.



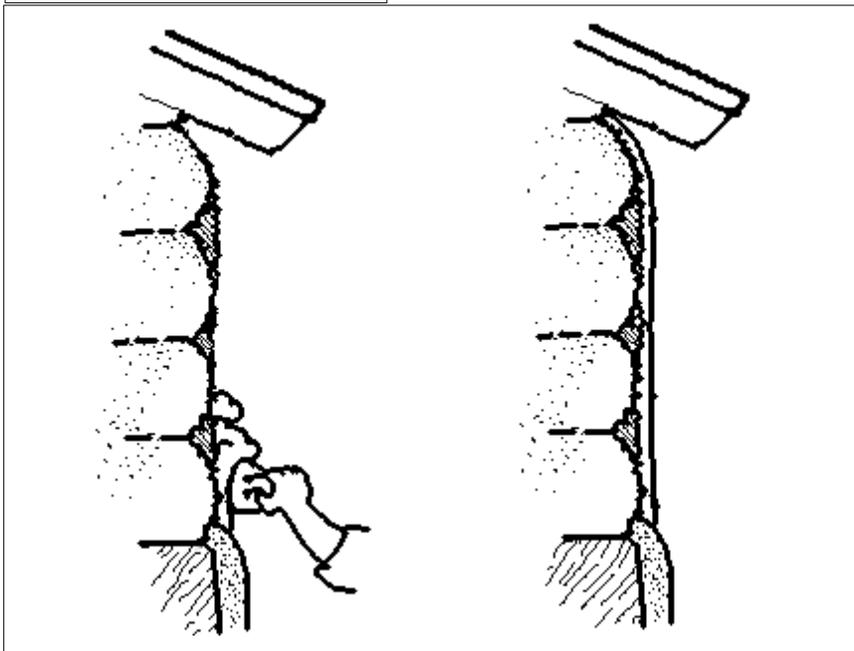
Because lime plaster works well on earthen surfaces, you can shape decorations on your walls before you plaster them.

Make shapes with a sticky plaster that contains a lot of straw. To create thicker shapes or overhangs, add some wire mesh and attach it well with nails to the wall.



Let all the plaster dry until it is hard. It does not need to be completely dry.

Before plastering add a little water to the wall. Always put plaster on damp surfaces.



You can apply a thin layer of lime plaster. Start at the bottom on top of the cement stucco base.

Push the plaster firmly into the wall, and spread it upward.

During the first two days protect lime plaster from drying too quickly. Work in the shade. Plaster a west wall in the evening when the sun is not hitting it strongly. On hot days spray a little water on fresh plaster that is in the sun.