



# Hydraulic lime plaster/render

## Application Guide

### Golden Rules

- choose the right lime and an appropriate aggregate.
- ensure the render/plaster is very well mixed - balling must be avoided.
- use a gauging box or bucket to measure components - not a shovel.
- do not put too much in the mixer at any one time as this will reduce the quality of the mix.
- keep the wall well wetted before rendering commences.
- use the render within two hours of mixing.
- do not apply if the temperature is too low i.e. 5°C or below. Be prepared to protect from frost, excessive sunlight and drying wind. Protection may include hessian sheets, bubble wrap or sheets of polythene. In very warm weather wetting of hessian will help to reduce rapid drying. In the winter do not add antifreeze agents designed for use with Portland cement.
- keep render moist for 7 days. The set can only complete in the presence of water. The need to keep render damp is best achieved by the availability of a hose with a fine spray, not only will this ensure even coverage but the time taken will only be a few minutes each day (if indeed conditions require damping down). Be aware that the upper sections will dry quicker and may require additional damping to prevent failure.
- bear in mind the render will continue hardening for many weeks and final strength will not be achieved in less than one year.



Cement render removed and replaced with hydraulic lime render to restore breathability and flexibility.

### Preparing the mix

- mix the lime and aggregate by volume (check the specification for exact mix ratio for the job or refer to the table below), measuring of material must always be with a gauging box or bucket. The sand/aggregate should be sharp, well-graded and washed.

Building Material	Site Type	Suggested Base Coat	Suggested Top Coat – please note the top coat should not be stronger than the base coat
Cob, Rammed Earth	Internal	Fat Lime x 2 coats	Fat Lime x 1 coat
	External	Fat Lime x 2 coats or NHL 2 / NHL 1 x 2 coats	Fat Lime x 1 coat
Strawbale	Internal	Fat Lime x 2 coats	Fat Lime x 1 coat
	External	N/A	
Lath, Reed Mat, Reed Board	Internal	Fat Lime x 1 coat NHL 3.5 / NHL 2 x 1 coat	Fat Lime x 1 coat
	External	NHL 3.5 x 2 coats	NHL 3.5 x 1 coat
Soft Stone, Brick	Internal	Fat Lime x 2 coats	Fat Lime x 1 coat
	External	NHL 3.5 / NHL 2 x 2 coats	Fat Lime x 1 coat or NHL 3.5/NHL 2 x 1 coat
Hard Stone, Hard Engineering Brick	Internal	Fat Lime x 2 coats NHL 3.5 / NHL 2 x 2 coats	Fat Lime x 1 coat
	External	NHL 3.5 / NHL 2 x 2 coats	NHL 3.5 / NHL 2 x 1 coat
Concrete Blocks	Internal	NHL 3.5 / NHL 2 x 2 coats	Fat Lime x 1 coat
	External	NHL 3.5 / NHL 2 x 2 coats	NHL 3.5 / NHL 2 x 1 coat
Insulation Blocks*	Internal	Fat Lime x 2 coats NHL 3.5 / NHL 2 x 2 coats	Fat Lime x 1 coat
	External	NHL 3.5 / NHL 2 x 2 coats	NHL 3.5 / NHL 2 x 1 coat

To reduce the environmental impact of your lime plaster, use gaster® or lime hemp plaster as alternatives to standard lime plasters  
 \*Insulation blocks have very high suction, be careful to maintain moisture content in render.

- a conventional cement mixer can be used although for larger projects a roll pan or paddle mixer is preferable. Lime mortars mixed in drum mixers can be prone to balling but use of particular mixing techniques can reduce this. Switch the mixer on and dampen down the inside of the drum as this will help to reduce the amount of dust and prevent the lime from sticking too much. Switch the mixer off before adding two thirds of the water and half of the sand followed by all of the lime. Switch the mixer on, allow the water to thoroughly disperse throughout the mix (15-20 minutes) before adding the rest of the sand and more water if required. You will have to experiment for the first mix as the quantity of water will vary with sand moisture content – but be CAUTIOUS, for a 3:1 mix, initially add 6 litres of water, 30 litres of sand and then 20 litres of lime, mix, then add the remaining 30 litres of sand and adjust the water.
- add hair or synthetic fibre (approx 1.5kg per tonne) to improve the strength and durability of the render, tease it in towards the end of the mixing.
- use the mix within 2 hours.

### Surface preparation

The main points are to:

- ensure there is a good keying surface for the render, the wall should be structurally sound and in good overall condition.
- remove any loose material, the walls should be clean and free of vegetation.



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- dampen the surface to prevent rapid suction of water from the plaster/render, usually a mist spray will suffice but on very porous walls several applications of water the previous day and in the hour or two before rendering may be required using a hose.
- where evident, salts should be brushed from the surface and cleaned away from the structure, do not wash down as this will cause the salts to retract into the building.
- if there are large voids in the wall these should be filled first, this is called “dubbing out”.

### Application

- after damping the surface, the plaster/render can be laid on using the normal technique in two coats of approx 8-10mm. The first coat should be left to stiffen up and then a float used to compress the render over the whole area. Applying the second coat too early (i.e. before the material has stiffened) can weaken the render. The result may be voids deep in the render which make the render vulnerable to frost damage. Within an hour or two, the surface of the first coat should be scratched over using a suitable wire comb.
- once the first coat has hardened enough a similar technique is used for the second. The time interval between the two will vary depending upon the temperature. As little as 24 hours in warm conditions but several days if cool during this time, it may need damping down if drying too quickly.
- if a top coat is required, the mix will be different, it is usually a weaker mix than the background mixes, (refer to specification table) proceed as above, it should be ‘floated up’ as the surface stiffens, in a similar way to the previous coats.

### After care

- the plaster/render must be kept moist for several days to a week after application of the final coat. Water will tend to drain down from the top of the work and therefore particular attention must be given to spraying the upper sections. Remember water is essential for the hydraulic set. It is important while maintaining the moisture to prevent rapid drying from wind and bright sunlight. Covering the work with damp hessian is the best procedure.
- protect from frost - hessian covers or bubble wrap should be used. However a circulation of air must be maintained between the cover and the render. Do not use anti-freeze additives. During daylight hours if warming winter sun is available, covers should be lifted to allow heat to be absorbed and then replaced during late afternoon. Even under these conditions a circulation of air is advisable between covers and masonry.

### Additional note for interior plastering with Hydraulic Lime

Techniques for interior plastering using hydraulic limes are the same as for exterior work with the exception that for base coats a well graded, sharp sand is still recommended. Finer sands can be used for top coats depending upon the finish required or a fat lime finish plaster can be used.

### Prevention of shrinkage

Shrinkage ‘cracking’ is a risk with all renders. However on cement renders cracking will allow water behind the render with little ability for it to evaporate out. Lime renders are designed to breathe. Small shrinkage cracks in the scratch coat are okay and will be filled in subsequent coats, nevertheless excessive cracking should not be accepted since it may be an indication of early failure. The causes of shrinkage cracking are:

- **too much water** in the mix forces particles of sand and lime apart.
- **excessive suction from the substrate** caused by lack of damping down prior to applying render.
- **rapid drying** caused by strong sun or drying winds.

If the last two points are assessed as the cause of the shrinkage, consideration should be given as to whether the setting process has been stopped due to lack of water. If only a few days have elapsed then remedial spraying may allow the set to continue.

### Storage

- lime should be stored airtight, dry and frost-free.

### Painting of renders and plasters

With lime renders and plasters it is recommended that limewash or a breathable paint is applied. The use of synthetic paints is not recommended since they will prevent subsequent carbonation.

Curing of the render takes many months, they should not be painted until carbonation is complete.

### Health and Safety Information

#### WARNING



**Skin Irritation 2 H315** Causes skin irritation.

**STOT SE 3 H335** May cause respiratory problems.

#### DANGER



**Eye Damage 1 H318** Causes serious eye damage.

#### Precautionary Statements

**P102** Keep out of reach of children.

**P280** Wear protective gloves, eye protection/face mask.

**P305 + P351 + P310** If in eyes rinse cautiously with water for several minutes and immediately get medical assistance.

**P352 + P352** If on skin, wash affected parts immediately with plenty of soap and water.

For further information about the whole subject and illustrated diagrams of lime plastering and pointing techniques, see **The Lime Handbook** now available to order on [www.lime.org.uk](http://www.lime.org.uk) or see our YouTube ‘How-to’ videos (link on home page of [www.lime.org.uk](http://www.lime.org.uk))

