

Living with lath and haired-lime mortar (non-hydraulic)

A beginners' guide to its usage on an internal fabric

Lime was in use more than 6000 years ago. In Egypt, it was found plastered on pyramid walls, as relevant experts confirm.

Try

<http://www.minervaconservation.com/articles/abriefhistoryoflime.html>

if you are interested.

Lime is limestone crushed into small lumps and burnt at a high temperature, which results in the creation of grit 'quicklime'. This boils when placed in water and the result is putty lime.

Lime mortar, when combined with hair, is an extremely versatile product capable of surviving damp, impact damage or movement, and is relatively cheap.

Its origins lie in the mud and muck-daubed reed walls of ancient civilizations when it was understood that by standing the daub plaster off a damp wall and creating an air gap between the wall and the reed with a timber/twig batten, humidity was not transferred through to the living space. The flow of air in this cavity was also important to ensure the drying effect was continuous and spore-free.

Subsequently, any long stranded material such as straw or hair was introduced as a binder to help its stability and ensure the squeezes between the reed gaps, called key gaps, held together.

How it was used: an example

In Early Georgian, Regency, Victorian and early Edwardian houses, the main external walls are solid – no cavity – so one was created by laying up thick vertical battening, nailed to horizontally embedded timbers put into the walls during construction.

Split (sawn in late Victorian and Edwardian times) pine, chestnut or oak laths were then nailed across the battens with gaps set at the thickness of a man's small finger: $\frac{3}{8}$ths to $\frac{1}{2}$ inch.

Putty lime, so called because it looks like/acts like putty, was mixed with sands, and hair from goats, horses or cows was teased/worked into the mix until it was deemed ready.

The plasterer worked/troweled the mix up and across pre-wetted laths to squeeze the mortar through the lath gaps and slump down, gripping the laths.

The work was keyed (crisscrossed) and left to carbonate/dry. Further coats were laid until the surface was flat. The facing coat comprised putty lime and fine silver sand, worked flat. Ceilings were also lathed and worked to joists instead of battens.

This system has never been bettered.

Problems and what to do about them

Repair: The reasons for failure range from excessive damp intrusion causing timber rot, compromised ventilation, modern repairs in plasterboard and gypsum, and property development. Very rarely is poor quality mortar the cause, though fast drying may have rarely caused weakness in the finished product.

Important to remember: The skill and knowledge level required to work on lath and plaster walls and ceilings is not a job for amateurs or plasterers not trained in the use of lime mortars.

Some reasons for collapse

Walls

If the laths and mortar stay damp over time, hair nail and lath rot can cause the work to pull away from the battens and/or the battens to drift away from the wall itself. A small area would need to be carefully cut out to establish the full extent of the failures. This would also reveal if the products had rotted away. The use of an endoscope to view into the void gives a lot of information to help restoration.

Ceilings

Vibration, wash-through and/or slump snap off by poor floor void cleaning and/or service installers, are the usual causes. Provided the damage is not too serious, and because the mortar is haired, it can be face screwed back into place and the damage smoothed off.

Replacement to original spec is always best because:

- Battens and laths, well fixed, form a part of the residual strength of the wall.
- Lathed lime mortar ceilings are stronger and transmit less vibration/noise to the rooms above and below. Because the mortar has trapped air pockets, it's at a relatively warm temperature.
- These works can tolerate damp and resist fungal growth and are therefore healthier.
- It can tolerate building settlement. Evidence of micro-cracking over a wider area means stress is dispersed evenly.

Do:

- Ensure that you identify and deal with anything causing damp or water ingress; look out for vertical or horizontal cracking to the exterior render.
- Be mindful of rising damp, soil/patio levels being raised, blocked wall vents, leaks in internal plumbing and grey waste pipes.
- Check to see that the vertical airflow is good in the cavity (no changed skirtings and plasters down to the floor)
- Call in an expert surveyor and/or a lime plaster company to confirm the cause of any problems and recommend a course of action. It can be a problem finding an appropriately skilled and experienced person but persist – there are experts and specialists out there. They can help you save thousands of pounds.

Don't:

- Try to repair lime mortar with gypsum plasters. They separate and crack.
- Use plasterboard to make 'patches.' They also crack at the meeting joint.
- Put cement products in lime mortar to harden it quickly. It results in the total ruination of the mortar as it removes the breathability and warmth-retaining properties. It also makes it harder and denser, thus colder, and impermeable. In short, it is the worst thing to do.
- Allow the new lime plaster coats to dry too quickly. This weakens the work to failure.
- Use poorly trained workers with little knowledge of lime working (See **Do.**) Work that involves the use of lime can be dangerous. If you are watching what your builder/plasterer is doing, wear protective clothing and goggles.

- If lime splashes onto your bare skin or you swallow any, use copious amounts of clean drinking water to reduce its effects and seek immediate medical help. It is not poisonous but tastes horrible. (Hot limes are another subject.)

Disclaimer

This fact sheet is designed to inform the reasons for why and how these methods and materials work, and/or don't. It is not intended as a substitute for advice from a qualified heritage surveyor or professional heritage builder. Anyone wishing to repair, decorate or renovate a building should consult a qualified person.

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