



Lime Plastering

HISTORY AND SCIENCE IN THE MIX

It's not clear precisely how long lime plasters and renders have been in use (plaster being the internal coating and render the external coating), but evidence can be found dating back as far as approximately 4000 BC when lime plaster was used in the pyramids of ancient Egypt. Some of the earliest documented guidance relating to the use of lime putty plasters can be found in the writings of Vitruvius, a Roman architect and engineer, who describes the basic procedures for making 'stucco' (plaster) from slaked lime putty back in circa 40 BC. Vitruvius, The Ten Books on Architecture. And it was the Romans who introduced the use of lime to the British Isles circa 43 AD... a little behind the times, it might be said!

Many of you will be familiar with the fundamental benefits of lime binders over conventional materials, such as good vapour-permeability (breathable) and flexibility, but the durability of lime plasters is often overlooked. Solid, sound examples of lime plasters and renders which are hundreds of years old are commonplace in homes and properties across the country – outliving lifespans associated with their modern counterparts many times over! Aesthetically, lime plasters are also more in keeping with our traditional buildings, particularly when compared to harsh looking alternatives such as cement.



The manufacturing process for traditional plasters begins with calcium carbonate, in the form pure limestone and seashells, which is burnt at temperatures up to 900°C to produce calcium oxide. This 'quicklime' is then added to clean water in a process known as slaking and left to mature for approximately 12 weeks, resulting in calcium dihydroxide, more commonly known in this form as lime putty. The lime putty was then



The art of decorative plasterwork using lime putty and gypsum

(photo courtesy of Sean Wheatley Plastering)



Lime putty plaster made with fine kiln dried sand

added to appropriately sized aggregates for renders and plasters, and sometimes mixed with other binders or additives to give suitable properties for a wide range of protective and decorative applications.

Fine sands were selected and mixed with lime putty for internal finishes, with coarser sands used for thicker coats of external render (which often included the addition of animal hair for flexibility and strength). Marble dust enabled rich, mature putty to be polished for decorative plaster effects, and the gypsum-based plaster of Paris is combined with lime putty for the traditional renovation and replication of decorative plasterwork and comicing.

APPLICATIONS FOR REPLICATION AND CONSIDERATIONS IN RESTORATION

One significant benefit with traditional lime putty plasters and renders is that the type of materials and sequence of coats are generally consistent for most applications.

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A traditional lime burning kiln (personal protective equipment advised!)



3 coat lime plaster on to timber lath



External renders on to solid masonry normally consist of a harl/scat coat, a haired scratch coat and an unhaired float coat (with the addition of an extra dubbing-out scratch coat for very uneven substrates).

Internal plasters on to solid masonry are the same as for rendering but an extra top coat of fine lime plaster skim is normally included.

Variations on these fairly standardised lime plaster and render specifications can include the use of a pozzolan (a natural setting agent) for external applications, and the omission of the harl coat when application is directly onto reed or timber lath.

As with many construction materials, building limes have evolved in recent years and the UK has seen the introduction of many pre-mixed natural hydraulic lime and formulated lime renders which offer benefits such as improved insulation, or the ability to be applied onto carrier boards (such as wood fibre, cork or wood wool). The sheer number of modern variations will undoubtedly lead to confusion when researching and deciding on the best approach to your own situation. Be sure to make use of independent advice from industry experts, such as the Listed Property Owners

Club (LPOC) and Society of the Protection of Ancient Buildings (SPAB), before seeking guidance from established and reputable suppliers who offer a range of solutions, as these are less likely to be biased towards a specific product or brand. Remember that not every solution will be appropriate or available to your property so speak your local building control and conservation officer before committing yourself financially.

The renovation of period properties is often required to maintain and restore our homes to their former glory. This could be the result of failed materials due to their age or from alteration to the property, or possibly due to the detrimental effect of inappropriate materials resulting in damp, mould or decay. Careful consideration should always be taken to restore sympathetically but also in doing what is necessary to maintain rather than replace altogether, wherever possible. 'Conservation repair' is a philosophy associated with SPAB which states that 'the only work that is unquestionably necessary (whether it be repair, renewal or addition) is that essential to a building's survival. Old buildings cannot be preserved by making them new.'

Applying this principal to lime plasters and renders may suggest the selection of a complete sympathetic replacement as it's often difficult to repair the existing material with new coats of lime. In some instances, primers or renovation plasters can be used to make good without going to the disruption or cost of a complete replacement. However, care should be taken to ensure renovation materials are compatible and will not have a detrimental effect on the fabric of the building.

STANDING THE TEST OF TIME

A wealth of information, research and shared knowledge is available at our fingertips when investigating construction materials and their benefits specific to our own projects. But like any online results found on popular search engines, or views from industry 'experts', there's often a lot of inconsistency and strong opinion to sort through before finding the right answers. If there's any doubt then surely the achievements of ancient craft and skill that have stood the test of time, whether it be an intricate ceiling rose, the magnificent pyramids of Giza, or a Victorian lath and plaster ceiling, are proof enough to tell us all we need to know when considering the renovation or replacement of plasters and renders in our beautiful, traditional homes. 🌿

Article by Ryan Stojic
Mike & Wye Associates Ltd
 01409 281644
www.mikewye.co.uk