



# TECHNICAL ADVICE

## Hair/Fibre Re-Inforcement in Plasters & Renders TAN9

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Animal hair has been added to reinforce and reduce shrinkage in lime plasters for centuries. Reinforcement is particularly important when applying basecoat plaster to laths (especially ceiling laths) as it reinforces and strengthens the crucially important ribs from which the ceiling plaster 'hangs'. The first 'pricking-up' coat traditionally contains hair reinforcement at a rate of at least 8kgs/m<sup>3</sup> (c.4kgs/tonne). Subsequent coats to lathwork and all coats to solid backgrounds normally have hair added at the reduced rate of 5kgs/m<sup>3</sup> (c.2.5kgs/tonne).

Hay and straw were sometimes used as alternatives, but the majority of traditional basecoat plasters were reinforced with animal body hair from horse, cow, pig or goat. When examining dry historic plaster it is normal to find hair reinforcement present and apparently in good condition. However, recent analytical work is suggesting that some degradation and loss of tensile strength occurs over time.

This degradation appears to occur more rapidly in currently available animal hair. Most animal hair is now imported in neat bundles from countries where anthrax is endemic, and the hair is sterilised in the country of origin to ensure all anthrax bacteria is destroyed. This treatment, which can include boiling and/or steam treating, appears to decrease the resistance to degradation and reduce the durability of the hair in the alkali lime environment. It is thought the protective keratin proteins and natural oils in the animal hair are depleted during the sterilisation treatment.

There have been failures of newly-applied lime plaster ceilings (not ours, thankfully) that have been attributed to rapid degradation of hair in the moist alkali environment. Until the situation is clarified, Rose of Jericho has decided to replace the animal hair in haired plasters and renders with a blend of polypropylene and sisal plant fibre. This works well technically but lacks historic authenticity. We hope that this proves to be a short-term cautious expedience and intend to revert to animal hair once a suitable alternative source of durable material is located.