

Successful Rendering using Lafarge Packed Cement



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1. Introduction

Lafarge Cement produces a number of products that can be used in rendering including:

- Procem
- Mastercrete
- General Purpose Cement
- Snowcrete

All these products conform to BS EN 197-1, are CE Marked, and are suitable for use in rendering if the correct practices are followed. These cements do however all have slightly different properties, and this leaflet gives some guidance on how to get the best performance from these products when used in rendering. This is particularly important if the end-user is unfamiliar with the characteristics of a particular product.

2. The Key Steps

The key steps for a successful rendering job can be summarised as:

- Understanding the nature of the substrate (wall)
- Preparing the substrate
- Selecting the most appropriate render mix
- Applying a suitable scratchcoat
- Curing the scratchcoat
- Applying a suitable topcoat/finishing coat
- Curing the topcoat

We will look at each of these aspects in turn.

2.1 The Substrate

Understanding the nature of the substrate (the wall to be rendered) is critical to the success of any rendering job. The key properties of the substrate are:

- Strength
- Water absorption or 'Suction'

In general, stronger substrates will require stronger render mixes. Whilst a degree of suction is required to enable the scratchcoat to bond to the substrate, excessive suction (as might be found with aerated concrete blocks) may suck too much water out from the scratchcoat or any applied spattercoat. This in turn will inhibit cement hydration (particularly with General Purpose Cement and Mastercrete which are relatively slow

setting) and cause a significant reduction in both the bond and the strength of the scratchcoat and/or spattercoat. Excessive suction can usually be prevented by dampening the surface of the substrate before applying the scratchcoat.

2.2 The Render Mix

The first point to consider is: What type of cement do I have?



- Procem: A Portland cement of strength class 52,5N (CEM I 52,5N)



- Mastercrete: A Portland-limestone cement of strength class 32,5R (CEM II/A-L (or LL) 32,5R)



- General Purpose Cement: A Portland-fly ash cement of strength class 32,5R (CEM II/B-V 32,5R) or Portland-limestone cement of strength class 32,5R (CEM II/A-L (or LL) 32,5R)



- Snowcrete: A White Portland cement of strength class 52,5N (CEM I 52,5N)

Check the colour coding of the bag and the cement type (on the CE Panel on the front of the bag) before use.

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The traditional mix proportions for render are given in Table 1, right.

The same proportions can be used for all the Lafarge cement products listed above.

Note: Lafarge supplies Hydrated Lime under the HYDRALIME brand name.

The Choice of sand is also an important factor in successful rendering, whatever type of cement is used. Clean sharp sand is generally preferred for the scratchcoat, and a 'rendering sand' based on a mix of building sand and sharp sand is often used for the topcoat. Sand containing high levels of clay must be avoided as this results in high shrinkage leading to cracking and crazing of the render as well as reduced bond between coats.

There are also a large number of proprietary mortar admixtures (plasticisers) on the market, but not all of them will be compatible with all cement types. The admixture packaging should be examined for indications of compatibility with different cement types. In case of doubt always consult the admixture supplier and/or carry out trial mixes.

As Mastercrete is already air entrained, we would recommend that an air-entraining plasticiser is not normally necessary with this product or, if used, it should be used at a reduced dosage. Once again trial mixes should be carried out to determine optimum plasticiser dosage.

2.3 Batching

Correct selection of mix proportions and batching is key to successful use of all cement-based materials.

Render is traditionally batched by volume. When batching by volume, the use of 'batch boxes' or buckets is preferred to batching 'by the shovel' as it gives better control over the final mix proportions.

Table 1: Traditional mix proportions for render

Designation	Cement: Sand (plasticised)	Cement: Hydrated Lime: Sand
i	1 : 3	1 : ¼ : 3
ii	1 : 3-4	1 : ½ : 4-4½
iii	1 : 5-6	1 : 1 : 5-6
iv	1 : 7-8	1 : 2 : 8-9
v	-	1 : 3 : 10-12

2.4 Mixing

For optimum performance, it is important that all the constituents are thoroughly and uniformly mixed together. Mixing using a mechanical mixer is generally preferred to hand mixing as it gives a more uniform mix.

Always use the minimum quantity of clean potable water needed to achieve the desired workability or consistency.

If mixing by hand, mixing should take place on a clean hard surface (wood or metal). It is important that water is contained in the mix as it will carry cement with it if it spills over, and reduce the final strength of the mix.

2.5 Render Application

The need to understand the nature of the substrate and its suction was highlighted in section 2.1 and the typical suitability of different render designations is shown in Table 2, below. Typically the same cement type would be used for both the scratchcoat and the topcoat.

2.5.1 Spattercoat/Scratchcoat

Slower setting cements such as General Purpose Cement and Mastercrete in particular, require effective control of the suction from the substrate in order

that the spattercoat/scratch coat bonds effectively to the substrate.

Once the scratchcoat is applied (and mechanically keyed to receive the topcoat), it must be promptly and effectively cured. A strong key ('wavy line') is preferred, but it should not penetrate right through to the substrate. Curing is the prevention of excessive water loss from the render to its surroundings and to the atmosphere. If water is lost from the render at an early age, the continued hydration and strength development of the render is impaired. It is inadvisable to apply render in full sun. Suitable curing techniques include:

- Covering the exposed surfaces with polythene sheeting
- Covering the exposed surfaces with wet hessian (sacking). The sacking should be maintained in a continuously damp condition
- Keeping exposed surfaces damp by using a water mist spray

Whichever method of curing is used, it should be kept in place for at least 7 days before applying the next coat.

Table 2: Typical suitability of different render designations

Render Designation	Render Characteristics	Typical Substrates
i	Strong, relatively impermeable with high drying shrinkage	Engineering bricks, In-situ concrete, Dense concrete blocks
ii	Moderately strong	Calcium silicate bricks, some facing bricks
iii	Medium strength with greater permeability than Designation i, but less likely to craze and crack	Lightweight aggregate blocks, some common bricks, Aerated concrete blocks
iv	Moderately low strength	Aerated concrete blocks, some softer bricks
v	Low strength	Weak materials in sheltered locations

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The early-age strength development of the different Lafarge products is typically (fastest first):

Snowcrete > Procem > Mastercrete > General Purpose Cement

Consequently, render scratchcoats containing Mastercrete or General Purpose Cement will require more curing time in order to develop sufficient strength to support the topcoat than renders based on Snowcrete or Procem.

2.5.2 Topcoat/Finishcoat

Once the scratchcoat has been properly cured, the topcoat or finishcoat can be applied. Good practice is that the topcoat should be weaker (higher designation number) or thinner than the scratchcoat, or possibly both.

Again, any potential suction between the scratchcoat and the topcoat must be controlled. The use of fibre mesh over joints and lintels etc will reduce the risk of cracking in these areas

When the topcoat has been applied and finished, using pressure to push the topcoat into the keyed scratchcoat, curing measures should be put in place promptly, using one of the methods described above. The curing should remain in place for at least 3 days (and longer if practical) in order to prevent surface crazing or dusting.

3. Summary

Although this leaflet is not a comprehensive or definitive guide to rendering, it does provide guidance on how best to ensure a successful rendering job using Lafarge packed cements. It is particularly important to recognise the different characteristics of the different products and to appreciate the critical role of curing in developing optimum cement performance.

Further information can be obtained from codes and standards, Lafarge technical literature or from the Lafarge Cement Technical Helpline (0845 812 6232 or info@uk.lafarge.com).

For further information

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