

Substrate Specification Sheet 6

Armourcoat (ASF) QA Working Specification For Sand/Cement Substrates

1 Introduction

This specification is for guidance only. It is offered to assist applicators to address and understand the potential problems associated with cement-based renders.

Our recommendations do not claim to be right or the only suitable approach to rendering. They are offered without commitment or liability.

Polished Plaster does not shrink or crack when drying. It is a hard product and any cracks forming in the substrate will penetrate through the finish.

The strength of a cement mix is determined by its cement content, but the benefit of the strength given by the cement may induce problems which need balancing with good working practice.

Sand/cement compositions, inappropriately formulated or used badly, can cause any of the following problems:

- Delamination
- Drying Shrinkage
- Alkali Silica Reaction (ASR)-Micro Cracking
- Efflorescence

All of these problems are potentially serious, but the most serious is shrinkage movement caused by the early strength of the cement which some backgrounds cannot restrain causing delamination and serious cracking. General shrinkage causing micro-cracking, often the result of alkali silica reaction (ASR) or by permitting the render to dry-out too quickly, will also induce cracking problems.

It is only where the most appropriate formulation of a cement mix for the location and purpose for which it is to be used, allied to best working practice, that cement render will be totally satisfactory.

2 The considerations for best practice are as follows:

- 1 Specify dense, strong building materials.
 - Dense concrete block BS 6073 Class A minimum compressive strength 7 N/mm².
 - Plain Fletton brick or similar.
 - In-situ concrete. Smooth surfaces shall be scabbled to remove laitance, formwork, releasing agents and curing membranes

- 2 Specify brick or blocks with low shrinkage on drying out.
- 3 Specify fully dry and cured blocks - at least 28 days old.
- 4 Reduce the cement content to the lowest percentage value appropriate for the purpose/location in which it is used.
- 5 Dub out in layers of not more than 10 mm thick.
- 6 Specify two-coat rendering - an undercoat of 8-10 mm (maximum) and a finish render coat of 6-8 mm (maximum).
- 7 When specifying polished plaster externally, always consider in the design the implications of efflorescence caused by dampness permeating the render matrix from the ground or through walls below the damp proof course (DPC). Also abide by considerations stated in SSS10
- 8 Specify the correct grade of sand - use the coarsest and sharpest washed plastering sand for the undercoat and clean well-graded sharp angular plastering sand for the finishing coat.
- 9 Consider the risk of Alkali Silica Reaction (which can lead to surface cracking/crazing) and add lithium hydroxide or other similar approved ASR reducing agents. If micro-cracking or, worse, fissuring occurs in the sand/cement render and the polished plaster cracks as a consequence, water will enter the matrix of the render which may cause efflorescent damage.
- 10 Consider the addition of water-based polymer latex (SBR) to improve bonding and reduce drying shrinkage.
- 11 Plan site operations to allow sand/cement renders to be kept damp and to cure for 28 days before specialist wall finishes are applied.
- 12 Require all operations to conform to the appropriate British Standard.

3 External Rendering Materials

3.1 Portland Cement

Portland Cement shall be ordinary Portland Cement complying with BS 12 : 1958.

3.2 Lime

Lime shall comply with BS 890 : 1972 Hydrated Lime and shall be proportioned and used dry.

3.3 Sand

Sand shall comply with BS 1199 : 1976 and shall be either naturally occurring plastering sand or shall consist of crushed rock or gravel or a combination of the two. It shall be graded to produce a good quality plastering sand. Sand for the undercoat shall be the coarsest and sharpest available and sand for the finish shall be sharp angular plastering sand of approved type.

All sand shall be clean and free from adherent coatings and shall not contain any silt or clay. It shall be free from deleterious salts likely to affect adversely the hardening strength, durability or appearance of the rendering.

3.4 Beads

The contractor shall fit standard render beads (stop beads for edges, bellcast beads for lower edges, and external angle beads for exposed 90 degree corners). Movement beads shall be specified where expansion joints are advised by an independent structural engineer. The beads shall be pre-galvanized steel and fixed mechanically and through adhesion. The bead depth shall be defined by the thickness of sand / cement render specified. (Render bead suppliers: Expamet Building Products (Tel: +44 (0) 1429 866 611)

4 Specification

Dubbing out of all undercoats - each layer not to exceed 8-10 mm maximum thickness.

Cement	1 part)	By volume
Lime	½ part)	and used
Sand	4½ parts)	within two hours

Finish Render Coat 6 mm average thickness.

Cement	1 part)	By volume
Lime	1 part)	and used
Sand	6 parts)	within two hours

The undercoat shall be finished to the specified straight or curved line. Irregularities greater than 10 mm in the line of the wall shall be dubbed out in layers not exceeding 8-10 mm thick and the final backing undercoat shall be finished to the desired horizontal and vertical line without deviations greater than:

plus or minus 1 mm in 600 mm
plus or minus 3 mm in 1800 mm

Use screed lines or screed lines and curved formers to make correct the specified wall configuration.

All undercoats shall be keyed lightly with a comb scratcher.

The finish render coat shall not be applied to the undercoat for 72 hours to reduce the risk of undercoat

induced cracking and shall be protected during this period from drying out.

The finish render coat shall be applied at an average thickness of 6 mm pressed well into the undercoat. Provided the final undercoat has been finished to the specified tolerance values, screed lines and formers will not be required when running the finish render coat.

When the finish coat has stiffened sufficiently, a 300 mm long wooden float shall be rubbed over the whole wall. The final layer of sand / cement render shall sit flush with the edge of the bead. The surface shall be ready as a smooth floated finish. A floated finish is less likely to craze.

To mitigate the risk of delamination and cracking, various proprietary additives can be used. It is the responsibility of the applicator to assess the site conditions; temperature humidity and exposure to the sun's rays and size of wall when determining the need for additives. All additives shall be used according to manufacturer's instructions.

5 Additional Literature

DOCUMENT	REF
Full Set of Building Substrate Specification Sheets are available. (See web site)	
Plasterboard/Drylining Installation and Finishing	SSS1
Plasterboard/Drylining with AntiCrack Substrates	SSS2
Plaster on Brick, Block or Concrete Substrates	SSS3
Glasroc and GRG Substrates	SSS4
Previously Decorated Substrates	SSS5
Sand/Cement Substrates	SSS6
MDF Substrates	SSS7
Duturo Backgrounds and Application	SSS8
Bluclad Board Substrates	SSS9
Exterior Application	SSS10

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