

Your guide to
PLASTERING



Creating Concrete Possibilities



Sand-cement plaster is used extensively in building work as a decorative or protective coating for concrete, masonry walls and concrete ceilings. The aim of this publication is to provide the information needed for successful plastering. It is intended for small building contractors and DIY or BIY homebuilders. Aspects dealt with include the selection of materials, surface preparation and correct plaster application.

Requirements:

Plaster has important requirements in fresh and hardened states. In the fresh state, plaster must be workable and cohesive. In the hardened state, plaster must:

- Be strong enough to hold paint and withstand local impact and abrasion.
- Be free of unsightly cracking.
- Be well bonded to substrate.
- Have an acceptable surface texture.
- Have an acceptable surface accuracy (with reference to plain or curved surface).

The properties of hardened plaster depend on the properties of the fresh plaster, the substrate and on the workmanship.

Selecting materials:

The properties of plaster, either in a fresh or in a hardened state, depend to a large extent on the properties of the materials used. Here is a guide to selecting your materials:

Cement:

All AfriSam cement products comply with SANS 50197-1. Our All Purpose and Eco Building Cements are recommended for making high-quality plaster mixes. Refer to our product brochures for instructions.

Sand:

Sand is a major component of a plaster mix and has a significant influence on its performance and material cost. In South Africa, natural sands, i.e. pit, river and dune sands are almost invariably used for plaster mixes. The sand should be clean (no grass, leaves, roots, twigs or any other foreign matter).

Note: Karoo sands which mainly consist of disc-shaped, dark-coloured particles should not be used for plastering. This is because they exhibit excessive swelling and shrinkage properties with increasing or decreasing moisture content.

Crusher sands are also not generally suitable, due to their angular particle shape. However, crusher sands are used successfully in rich mixes for special applications such as squash court plastering.

Important properties of sands are:

- Clay content.
- Grading.
- Maximum particle size.
- Particle shape.

Hydrated builder's lime can be added to the plaster mix when using sand which is lacking in fine particles, while sand with too many fine particles can be improved by washing or by blending with suitable coarse sand.

Note: Some coarser material may be acceptable or desirable for textured decorative work such as scratch plaster. Oversized particles should be removed by sieving.

Clay content:

Only a small proportion of clay is acceptable in plaster sand. Sands with a high clay content may generally be recognised as follows:

- Plaster mixes made with such sands are very "fatty" and tend to cling to a trowel.
- Plaster mixes made with such sands have high water requirement.

Water demand test:

Sand will determine the quality of the plaster. Sands that contain too much clay will cause plaster to crack. To assess whether sand is suitable, the following simple test may be applied:



If more than three litres of water is required to make a workable mix, then the sand is unlikely to be suitable for plaster work.

Specialist advice should be sought if there is any doubt about the content and type of clay in a sand.

Assessing the workability of the mix:

1. Form a flattened heap about 100mm high and 200mm in diameter on a non-absorbent surface.
2. Place a plasterer's trowel face down on top of the heap and try to push the trowel down.

A workable plaster will squeeze out from under the trowel and it will be possible to push the trowel to within a few millimetres of the underlying surface.

An unworkable mix will "lock up" once the trowel has moved a few millimetres and prevent further downward movement of the trowel. This mix will also bleed, resulting in water separating from the mix quickly.

If the mix appears to be workable, pick up some of the plaster on a trowel then tilt the trowel. The plaster should slide off easily. If it clings to the trowel, this mix is too fatty, an indication of excessive clay content in the sand.

Improving workability:

Hydrated builder's lime is effective in improving workability. The amount added to the mix may be as much as the amount of cement by volume.

Type of mixes:

Depending on the exposure conditions of the plastered surface, different types of plaster mixes are recommended.

Mix A:

Exterior/Exposed to dampness.

Batching by wheelbarrow

All Purpose Cement	Plaster sand	Approximate yield
		
2 Bags (1=50kg)	4½ wheelbarrows	0,25m ³

Area of plaster coverage (m²)

All Purpose Cement	Plaster thickness	Area of wall (m ²)
	10mm	24
	15mm	16
	20mm	12

Mix B:

Interior/Dry.

Batching by wheelbarrow

All Purpose Cement	Plaster sand	Approximate yield
		
2 Bags (1=50kg)	6 wheelbarrows	0,3m ³

Area of plaster coverage (m²)

All Purpose Cement	Plaster thickness	Area of wall (m ²)
	10mm	30
	15mm	20
	20mm	15

Surface properties required for successful plastering:

- The surface should be rough as this improves adhesion by providing a positive 'key' for plaster to grip on to.
- The surface should be absorbent to a limited extent, as it removes the water film between the surfaces and plaster that would tend to weaken adhesion.
- The surface should be strong and clean, i.e. free of dust, oil or paint that could impair the bond between the plaster and the surface.

Note that the strength of the surface material should be greater than or equal to that of the hardened plaster.

Preparation of various types of surfaces:

The texture of surfaces to be plastered should be sufficiently rough to provide an adequate key for the plaster to adhere to. For smooth surfaces, a spatterdash coat should be applied to provide a sufficiently textured surface for the plaster to adhere to.

Spatterdash:

This is a mixture of one part cement to one and a half parts coarse sand, with enough water for a sluggishly pourable consistency. The mixture is thrown with force onto the

wall, using a scoop or a brush with long and stiff bristles. The spatterdash should cover the substrate surface completely and form a rough texture with nodules about 5mm high. Spatterdash should be kept moist for at least three days and tested for adhesion and strength by probing with a screwdriver or knife before plaster is applied to it.

Smooth Concrete:

Apply spatterdash coat to smooth concrete. Ensure the surface is clean before commencing.

Concrete Masonry:

The texture of the masonry units should be sufficiently rough without further treatment. If not, apply a spatterdash coat. It should not be necessary to control suction of the surface by pre-wetting, unless the masonry units are very absorbent.

Burnt Clay Stock Brickwork:

The texture of bricks should be sufficiently rough without further treatment. If not, apply a spatterdash coat. Burnt clay stock bricks normally have a high level of water absorption, which would result in a rapid drying out of the plaster. If so, pre-wet the wall and allow it to become surface dry before applying the plaster.

Making plaster:

Batching:

- Batching sand by loose volume is acceptable. However, batches based on whole bags of cement are preferable.
- The size of the batch should be small enough to be used up within two hours.
- Should the plaster mix harden, do not add water as this weakens it. Rather discard and mix a fresh batch.

Mixing:

- Mixing can be done by hand or machine. However, machine mixing is preferable.
- Hand mixing should be done on a smooth concrete floor or steel sheet.
- First spread out the sand about 100mm thick, and then spread the cement uniformly over the sand.
- Mix until uniform and then gradually add water until you reach the right consistency.

Recommended plaster thicknesses:

- First coat :10mm to 15mm
- Second coat (if any) :5mm to 10mm
- Finish coat :5mm to 10mm

Note that, if plaster is applied in a single coat, thickness should be 10mm to 15mm. A single coat should not be thicker than 15mm.

Applying the plaster:

- Plaster should be protected from the sun.
- Plaster should be used within two hours of being mixed and never be re-tempered by adding additional water.
- Ensure that plaster is not continuous across the line of the damp-proof course as this will allow moisture to travel above the level of the damp-proof course.
- Plaster should be cut through to the applied surface where different surface materials meet, e.g. masonry and concrete.

The general procedure for applying plaster:

- For accurate work, apply screed strips before the wall is plastered. These are narrow strips of plaster along the perimeter of the wall, or at suitable intervals on the wall that act as a guide for the striker board.
- Using a rectangular plasterer's trowel, push the plaster onto the wall or ceiling using heavy pressure to compact the plaster and ensure full contact with the substrate. The plaster should be slightly proud of the intended surface.
- Once the plaster starts to stiffen, it should be struck off to a plane (or curved) surface using a light striker board. Material removed in this way should be discarded.
- If more than one coat of plaster is applied, the undercoat should be scored with roughly parallel lines about 20mm apart and 5mm deep. The purpose of the scoring is to provide a key for the next coat and to distribute cracking so that it is less noticeable.
- For the final coat, use a wood float to remove ridges made by the striker board, while at the same time filling in any depressions and then float flush with the surrounding plaster.
- If a very smooth texture is required, a steel trowel may be used on the surface (a smooth texture is generally not recommended as it tends to craze and show imperfections).
- Various decorative finishes are also possible. These include brushing, flicking plaster onto the surface and lightly floating.

Common problems:

Name	Description	Cause	Solution
Grinning	Positions of the mortar joints are clearly visible through the plaster.	Different rate of suction between the mortar and the bricks.	Apply plaster undercoat or spatterdash coat before plastering.
Crazing	Network of closely spaced, fine cracks.	Over trowelling a rich mix, or a sand that contains too many fines.	Use a better plaster sand. Do not over trowel.
Cracking	Larger cracks randomly spaced.	Movement of the wall or shrinkage of the plaster which is caused by excessive loss of water from the plaster. Using a badly graded sand that lacks fine material. Excessive suction by the bricks or blocks. Exposure to direct sun or wind.	Do not use very rich mixes (too much cement). Use good quality sands. Limit plaster thickness to a maximum of 15mm per coat.
Lack of hardness	Plaster that is easily chipped away or is easily scraped off after hardening.	Plastering in full sun and wind. Not wetting absorbent bricks. Addition of extra water after first mixing. Using a very lean mix (too little cement).	Avoid causes listed.
Debonding	Plaster not staying on the wall after hardening.	Dust on the wall when plastering. Over-rich mixes. Very thick layers of plaster (>15mm).	Prepare surface properly before plastering. Limit plaster thickness to a maximum of 15mm. Do not use very rich mixes.

Curing:

After the plaster has been applied and finished, it is essential to protect it from the sun and wind by covering it with a plastic sheet and keeping it moist for a minimum of seven days.

Conclusion:

Provided that sufficient attention is paid to the selection of materials, mix proportions, preparation of surfaces and the application of the plaster, the results should be serviceable and aesthetically acceptable. For further assistance, please contact AfriSam Customer Service.

Every effort has been made to ensure accuracy of data and information presented and no liability is accepted for errors or omissions.

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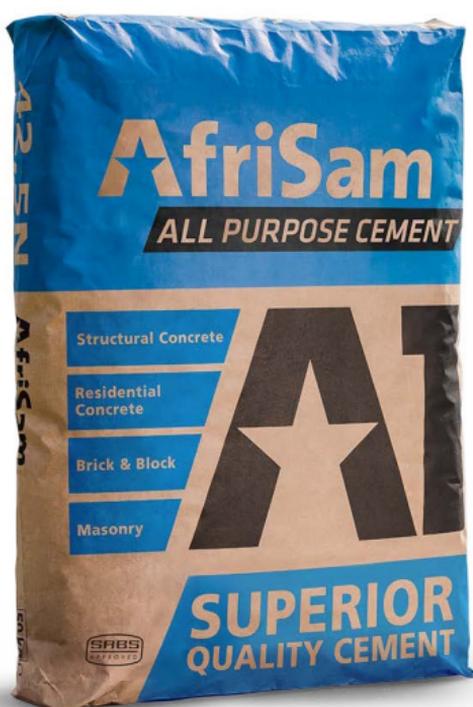
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OUR QUALITY PROMISE

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With the planet as one of our core values, we assess the carbon footprint of each and every one of our operations and products while actively striving to drive down our impact on the environment.