



# MATERIAL SELECTION IMPORTANT FOR SUCCESSFUL PLASTERING

There are plenty of pitfalls on the road to successful plastering - a building aspect that continues to pose challenges even to the most experienced contractors.

The following guidelines can be followed on the selection of materials for successful plastering:

Cements for plaster should comply with the requirements of SANS 50197-1 or SANS 50413-1. CEM I and CEM II A cements are used in plaster with good results. CEM II B-V or W cements are recommended for plaster exposed to damp conditions during service (eg. plastered plinths below damp proof course level and freestanding walls) to reduce the risk of efflorescence. Cement plaster should be applied in accordance with the requirements of SANS 2001-EMI.

Cement with slow early strength should be used only if protection of the plaster on the substrate (against sun and wind resulting in evaporation of moisture from the surface) will be adequate to minimize early cracking before the plaster has developed sufficient tensile strength.

Bags should be clearly marked with the strength grade, cement type, and a Letter of Authority (LOA) number issued by the National Regulator for Compulsory Standards and should guide mix proportions for plaster.

The choice of cement should be based on the properties of the sand to be used in the plaster. Sand is by far the major constituent of plaster and has a significant influence on its

**Sand-cement plaster is used extensively in building work as a decorative or protective coating to concrete and masonry walls and concrete ceilings.**

performance and material cost. In South Africa, natural sands, i.e., pit, river, and dune sands, are almost invariably used. An important requirement is that sand should be free of organic matter such as roots, seeds, twigs, and humus.

If sand includes lumps that are not easily broken between the fingers, it is not ideal for use in plaster; if such sand is to be used, then the lumps should be removed by sieving.



“Karoo” sands, which contain a high proportion of disc-shaped dark-coloured particles, should not be used for plastering because they exhibit excessive swelling and shrinkage on wetting and drying respectively. This causes excessive shrinkage cracking in the hardened plaster.

Important physical properties of sands are:

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

Only a small proportion of clay can be tolerated in sand used in plaster. Clay normally causes a high water requirement and high drying shrinkage.

Ideally, the sand should have a continuous grading, from dust up to the largest particles. The fractions passing the 0,150-mm and 0,075-mm sieves (“fines”) are important because they significantly influence the water requirement, workability and the level of water retention of the mix.

Increasing these fractions results in increased water requirement (with consequent lower strength and higher shrinkage) but improved workability and water retention. The optimum fines content is, therefore, a compromise between these properties.

For plasters, sand lacking in fines may be used in conjunction with hydrated builder’s lime, mortar plasticizer, or masonry cement, or it may be blended with fine filler sand.

Ideally, the particle shape should be nicely rounded with a smooth particle surface texture for good workability. The particle shape of natural sands tends to be rounded due to weathering, whereas that of crusher sands tends to be angular or flaky. However, some river sands contain newly weathered particles with a rough surface texture and angular particle shape. These particles are normally in the coarser fraction of the sand and should be screened out.

The water used in the plaster mix should be fit for drinking.

Provided sufficient attention is paid to the selection of materials, mix proportions, preparation of substrate surfaces and the application of the plaster, the results should be serviceable and aesthetically acceptable.

The School of Concrete Technology’s SCT12 course, “Mortars, Plasters, Screeds and Masonry” is presented online. For more information on this tuition or plastering in general, refer to the CCSA publications, “Successful Plastering”, and “Common Defects in Plasters”.

Below:  
Selecting the correct type of sand for a plaster mix strongly influences the ultimate performance and material cost

