

RENDER

SCOPE

This data sheet sets out information on the selection of render types, construction procedures and surface finishes using renders.

INTRODUCTION

Cement-based renders on both external and internal walls, perform a number of functions. These include improved fire rating, better water-proofing, and specific architectural appearance, eg the use of coloured and textured renders.

To achieve the best results from a render coating, it is important that: the mix is suited to the background surface; it is properly applied to the correct thickness in the appropriate number of coats and due attention is paid to curing.

MATERIALS

Cement Normally Type GP (General purpose portland) or Type GB (General purpose blended) cements complying with AS 3972 should be used.

Where a light-coloured render is required, off-white cement should be used.

Lime Hydrated lime should comply with AS 1672.1. Lime is added to make the render creamier and more workable. It also assists to minimise cracking as it provides a degree of elasticity to the render in its hardened state. It is good practice to soak the lime in an equal volume of water for 24 hours prior to use, as this will improve its performance in the mix.

Sand Sand should comply with AS 2758.1. It should be noted that the Standard covers a range of particle-size gradings and not all are suitable

for render. In general, coarsely graded sands are suitable for undercoats whilst finer graded sands are appropriate for finishing coats. Plastering sands and finer, washed, concrete sands (which are suitable for plastering) are readily available from retail hardware and building supply outlets.

Water Water should be clean and free from impurities. Normally, mains water is satisfactory.

Admixtures Admixtures should comply with AS 1478 as applicable and be used strictly in accordance with the manufacturer's instructions.

Generally, admixtures are not required for renders. Nevertheless, the use of air-entraining agents to improve workability is quite common. When using admixtures care is necessary as overdosing may result in serious loss of strength and bond.

Pigments Pigments should comply with BS 1014. The quantity of pigment added to colour the render should not exceed 10% of the mass of the cement in the mix. A sample of coloured render should be made and allowed to dry completely before commencing work to ensure the desired colour is achieved.



WHERE a light-coloured render is required, off-white cement should be used.

MIXES AND APPLICATIONS

Render mixes should be matched to the background surface to be rendered.

Suggested mix types for various background materials and the application are given in **Table 1**.

TABLE 1 Mix types for various backgrounds and applications

Background material	Application	Mix type
Low absorption background, eg dense smooth clay bricks, concrete	First coat	A
	Second coat	A or D
High absorption background, eg absorptive clay bricks, concrete masonry	First coat	C
	Second coat	D
Metal plaster base	First coat	A or C
	Second coat	B or D

The mix proportions for render should be adjusted to suit the available materials but should be kept within the ranges given in **Table 2**. The proportion of aggregate in the second coat should not be less than that used in the first coat, ie the second coat should not be stronger than the first coat.

TABLE 2 Material ratios for various render mixes

Mix type	Cement	Lime	Volume of aggregate per sum of volume of cement plus lime
A	1	0-3/4	2 1/2-4
B	1	0-3/4	3-5
C	1	3/4-1 1/2	2 1/2-4
D	1	3/4-1 1/2	3-5

SITE-MIXED RENDERS

Render can be mixed on site in one of two ways: in a mechanical mixer, or by hand on a board or in a wheelbarrow. Mechanical mixing is less strenuous and much more reliable than hand mixing. The latter should therefore be used only for very small quantities. Mixers should not be overfilled and revolve at speeds recommended by the maker.

Using a mechanical mixer

Step 1 Turn the mixer on and prime the bowl with a litre or so of water.

Step 2 Add the sand, pigment (if any) and then the cement.

Step 3 Blend together until a uniform colour is achieved.

Step 4 Add rest of water slowly and sparingly until a stiff mix that will sit up on a trowel is achieved.

Step 5 Continue mixing for at least 2 minutes.

Step 6 Discharge mixer.

Repeat process until required amount of render has been produced.

Mixing by hand

Step 1 Measure all the required dry materials for the batch into a wheelbarrow or onto a board.

Step 2 Mix dry materials together until a uniform colour is achieved.

Step 3 Mound the material and form a crater in the centre.

Step 4 Add water slowly into the crater and turn the material into the water.

Step 5 Re-mound and repeat the process until a stiff mix that will sit up on a trowel is achieved.

Step 6 Continue turning and mixing the material for a couple of minutes to ensure all the sand is uniformly coated with paste.

Step 7 Use render.

Repeat process until required amount of render has been produced.

Note: Use only enough water to make a stiff mix. The more water used, the weaker the mix and the greater the likelihood of subsequent shrinkage which may lead to bond failure or cracking.

PRE-MIXED RENDERS

Factory-blended, ready to use, general and special-purpose renders requiring only the addition of water are available in bags from most retail hardware and building supply outlets and decorative coating manufacturers.

APPLYING THE RENDER

Surface Preparation

The background surface to be rendered should be free from laitance, paint, oil, dust and any dirt or other loose material that may prevent a good bond from forming between the background and the render. Proprietary bonding agents, applied strictly in accordance with manufacturer's instructions, may also be used to improve adhesion. Renders should be applied within half an hour of mixing.

Table 3 indicates the preparation treatment necessary for a number of background surfaces prior to rendering.

TABLE 3 Background preparation

Background	Treatment
Smooth, strong eg high strength concrete, fibre-cement sheet	Scabble surface and apply dash coat or fix metal lath clear of surface
Strong/porous eg standard bricks, concrete blocks, concrete	Rake joints (if appropriate) and apply dash coat
Weak/porous eg lightweight concrete, render undercoat	Dampen surface

Surface Dampening

After initial preparation, the background should be dampened and allowed to dry back to a surface-dry condition immediately prior to rendering. This reduces excessive suction but still enables bond to be achieved in the case of weaker and open-textured backgrounds.

Dash Coats

Dash coats are used to provide adequate bond between the background and the subsequent render coat. Site mixed dash coats have the ratio of 1 part cement to 1 to 2 parts sand. The dash coat is flicked and splattered over the background to produce a rough finish to accept the render.

This open-textured layer is not trowelled level or smoothed out.

Number of Coats

This will depend on the condition and alignment of the background substrate. Any unevenness needs correction to attain an aligned surface. The conditions to which the render will be exposed and the type of finish will also dictate the number of coats.

Usually, one or two coats are all that is required for most work. A coat thickness should not exceed 15 mm. Allow at least three days between coats.

Undercoats

Undercoats are normally applied by trowel. They should have a thickness between a minimum of 10 mm and a maximum of 15 mm. Once the render is firm it should be raked or scratched to provide a key for the next coat.

Final Coats

Final coats are normally applied by trowel with a maximum thickness of 10 mm over the undercoat.

Decorative Finishes

A variety of decorative effects can be achieved using different finishing techniques on the final coats.

The application of decorative render finishes can be difficult and specialist application by certified competent tradespeople is recommended.

- **Trowelled** A trowelled finish can be achieved by skimming the final coat with a wood float to produce a smooth, dense surface or using notched trowels to produce a variety of textured finishes.
- **Bagged** A bagged or patterned finish can be obtained by rubbing a ball of damp hessian into the surface with different patterns being achieved depending on the action used.
- **Sponge** A sponge finish can be achieved by mopping or sponging the unhardened surface with a damp sponge. Do not allow water to run down the wall.
- **Rough cast** The final coat is thrown and flicked onto the surface and no retouching is done.
- **Textured** Textured surfaces can be achieved by the use of coarser aggregate in the final coat.

CONTROL JOINTS

Cement-based renders may crack for a number of reasons, eg shrinkage as the render dries out, or movement of the background material. With the careful placement of control joints, this unsightly cracking can be minimised.

Control joints should be formed to coincide with all control joints in the background and at locations in the structure where movement is likely to occur. Take particular care not to fill the control joint in the background with any render. Weep holes should also be carried through the render.

CURING AND PROTECTION

Rendering in direct sunlight or exposed, windy areas should be avoided where possible.

Render should not be allowed to dry out quickly. All render coats, including undercoats and dash coats, should be kept damp for three days or until the next coat of render is applied. Clear or lightly-coloured plastic sheeting should be used to protect fresh render for the first three days. Where possible, prevent the plastic sheeting from touching the render as it may lead to discolouration.

Protection is not normally required for internal renders provided the building will provide protection from the weather.

Further information on good concreting practices can be downloaded from the Cement Concrete and Aggregates Australia website at www.concrete.net.au.

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