

General

Concrete is the complex reaction product of aggregates, silica sand and calcium silicates present in cement. Lime is produced during the setting reaction that slowly further reacts with the silica sand to form more cement. This lime production accounts for the high initial alkalinity of concrete and is influenced by the amount of water added, type of aggregate and additives used. This high alkalinity may saponify (lime burn) many alkyds and PVAs. It is recommended that concrete is left for 28 days before painting with alkali-resistant paints, such as 100% waterborne finishes, three months for PVAs and one year for solventborne finishes. Excess lime may migrate to the surface as a milky deposit, efflorescence or lime staining. Resene Limelock (see [Data Sheet D809](#)) is recommended on all fresh plaster to prevent lime staining. Resene Limelock (see [Data Sheet D809](#)) is a preparatory coating designed to cure and seal cementitious surfaces by retaining moisture necessary to achieve cure and trapping free lime, minimising downtime between the completion of plastering and commencement of painting.

The cement matrix is slowly eroded by acids normally present in rain, so that old concrete has a weak, unbound layer of sand on the surface.

The above holds true for all concrete products although the different forms do have some individual differences:

- (a) **Cement renders (including EIFS, rough cast and stucco):** May have weak surface layers due to water loss from relatively thin layers leading to poor curing. Many renders have added lime leading to very high alkalinity.
- (b) **Concrete masonry:** The very low slump mixtures used in this area reduce alkalinity but increase porosity. Mortars used for jointing and reinforcing are generally highly alkaline.
- (c) **Concrete roofing tiles:** The factory applied cementitious coating breaks down on extended weathering to a fine powder which, if untreated, provides a weak substrate for paint.
- (d) **Fibre reinforced cement:** Low incidence of alkalinity and efflorescence in flat sheet; greater danger in moulded sheet. Some possibility of mould release oil contamination.
- (e) **Glass reinforced cement (GRC):** These very dense and glossy surfaces may also be contaminated with form release oils and defoamers.
- (f) **Old fibre reinforced cement (prior to 1982):** May contain asbestos. Contact local Health Authorities for advice on preparation work.
- (g) **Poured concrete:** More likely to have efflorescence and laitance due to higher slump mixes. Strong likelihood of form oils and/or curing agents being present.

Surface preparation

New concrete, concrete masonry and fibre reinforced cement

D83.1 Remove powdery layers and efflorescence

Remove any powdery layers, laitance or efflorescence by vigorous wire brushing or preferably waterblasting. Sand off any protruding fibres from fibrous cement.

D83.2 Degrease and clean surfaces

Thoroughly degrease by scrubbing or brushing down with Resene Paint Prep and Housewash (see [Data Sheet D812](#)) to remove all dirt, dust, grease, chalk, cobwebs and other contaminants. Rinse clean with copious amounts of clean water and test surface is degreased by wiping with clean cotton wool. Repeat process if necessary.

Cementitious surfaces

Cement render (Exterior Insulation and Finishing System (EIFS), rough cast, stucco), concrete, concrete block, fibre reinforced cement boards, glass reinforced cement and tilt slab

Referred to in Resene specification sheets:

- 1 Cementitious surfaces
- 17 Waterproofing membranes
- 18 Flooring systems
- 19 Anti-graffiti systems
- 20 Textured and specialist coatings

For smoke damaged surfaces see [D86](#)

For repaints see [D87](#)



D83.3 Test for moisture

Tape a 0.1mm clear plastic sheet (45cm x 45cm) to the concrete surface. Taping must provide an airtight seal between the concrete and plastic sheet. After 24 hours check the underside of the sheet for signs of condensation. Darkening of the concrete covered by the plastic sheet compared to surrounding areas also indicates the presence of moisture. If moisture is detected, allow an additional drying/curing time of 14 days and repeat test. If moisture is detected on second test, the surface cannot be successfully coated. A moisture test is not required if Resene Limelock (see [Data Sheet D809](#)) is being applied.

D83.9 Seal thin plasters

Resene Limelock (see [Data Sheet D809](#)) is recommended on all fresh plaster to prevent lime staining. Resene Limelock (see [Data Sheet D809](#)) is a preparatory coating designed to cure and seal cementitious surfaces by retaining the moisture necessary to achieve cure and trapping free lime, minimising the downtime between the completion of plastering and commencement of painting. Apply one coat of Resene Limelock (see [Data Sheet D809](#)) over the fresh substrate and allow to dry. Evenly coat all fresh cementitious surfaces to ensure uniform curing and that free lime cannot be transferred through weak points. When dark, heat absorbing topcoats are planned, it is prudent to wait seven days before painting. If Resene Limelock (see [Data Sheet D809](#)) is applied immediately following plastering, no surface preparation is necessary. If the surface has been allowed to weather, some surface preparation may be required, as for fibre reinforced cement.

Old concrete, concrete masonry, fibre reinforced cement, new and old cement renders and weathered roof tiles

In order to assess the condition of these surfaces prior to painting, scratch the surface with a penknife blade - if the surface can be scratched off as a powder the whole area must be thoroughly cleaned.

D83.1 Remove powdery layers and efflorescence

Remove any powdery layers, laitance or efflorescence by vigorous wire brushing or preferably waterblasting. Sand off any protruding fibres from fibrous cement.

Special attention needed

Fibre reinforced cement may contain **asbestos**. The removal and/or disposal of materials containing asbestos (or just the cleaning down of them) may require special permission and a licence. Contact your local Council to determine your obligations under their bylaws. Free asbestos is likely to be released during surface preparation and therefore suitable dust masks or respirators must be worn by all operators involved in surface preparation and disposal of waste. Special care must be taken to contain all debris and this must be kept wet and disposed of in a landfill. This material must not be left to dry out. Disconnect downpipes from asbestos roofs before starting work.

D83.2 Degrease and clean surfaces

Thoroughly degrease by scrubbing or brushing down with Resene Paint Prep and Housewash (see [Data Sheet D812](#)) to remove all dirt, dust, grease, chalk, cobwebs and other contaminants. Rinse clean with copious amounts of clean water and test surface is degreased by wiping with clean cotton wool. Repeat process if necessary.

D83.4 Remove all moss and mould

Thoroughly clean down to remove all loosely adhered material. Treat areas of moss or mould infestation with Resene Moss & Mould Killer (see [Data Sheet D80](#)) correctly diluted with clean water. Leave for up to 48 hours to achieve full kill. For heavy infestations further applications may be needed. Wash thoroughly with clean water to remove residues.

D83.5 Waterblast 3000 psi

Carefully waterblast at 3000 psi to remove all dirt, chalk, moss and mould residue and any other contaminants. Allow the surface to dry out for at least 24 hours.

D83.6 Seal surfaces

Allow to thoroughly dry then seal with a full coat of Resene Concrete Primer (see [Data Sheet D405](#)) on sound concrete or Resene Sureseal (see [Data Sheet D42](#)) or Resene Waterborne Smooth Surface Sealer (see [Data Sheet D47a](#)) on weathered concrete.

Smooth/glossy concrete and glass reinforced cement (GRC)

As for old concrete, concrete masonry etc except replace D83.6 with D83.7 below:

D83.7 Seal smooth/glossy surfaces

Allow surface to thoroughly dry out, then seal with a full coat of Resene Waterborne Smooth Surface Sealer (see [Data Sheet D47a](#)) on GRC or Resene Concrete Primer (see [Data Sheet D405](#)) on glossy/smooth concrete.

Concrete floors

Floors are prone to a wide range of contamination, so surface preparation is the critical factor in achieving a long lasting paint system. New concrete floor slabs must be allowed to cure for a minimum of 28 days prior to painting. The preferred surface preparation is by diamond grinding or captive shot blasting. An alternative method is acid etching (refer D83.8 below). Some new floors may have had a curing membrane applied or may contain additives that harden the surface. These treatments result in a surface that is usually resistant to dilute acids and that requires alternative preparation by mechanical abrasion or captive shot blasting. All concrete floors must be checked for excess moisture before coating. In the case of new concrete the test must be carried out after the minimum recommended curing period.

Refer above for the following surface preparation clauses:

D83.1 Remove powdery layers and efflorescence

D83.2 Degrease and clean surfaces

D83.3 Test for moisture

D83.4 Remove all moss and mould

D83.5 Waterblast 3000 psi

D83.6 Seal surfaces

D83.7 Seal smooth/glossy surfaces

D83.8 Acid etch

Before applying the acid etch solution the concrete surface must be free of dirt, dust, loose material, grease, fat and oil. Remove loosely adhering contaminants by brushing with a clean stiff-bristled broom or vacuuming with a heavy duty industrial vacuum cleaner.

Pre-wet concrete surface and either brush or vacuum off excess surface water. Uniformly apply etching solution to damp surface using a plastic watering can. The etching solution may be either hydrochloric acid diluted with six parts by volume of water or phosphoric acid diluted with ten parts by volume of water. Bubbling should be immediately evident over the entire surface. If this is not the case re-treat with suitable detergent and repeat the acid etching step.

Scrub the acid wetted surface with a stiff nylon brush when the etching solution bubbling begins to subside (5-15 minutes). Rinse off with copious quantities of clean water and at the same time scrub with a stiff broom to remove concrete salts.

Etching should produce a concrete surface that is clean and has a slightly roughened profile. If desired surface roughening is not achieved, repeat the etching procedure. After the desired surface profile is achieved, flush with copious quantities of clean water until the pH of surface washings is neutral or slightly alkaline. Allow to dry. Vacuum removal of surface water will aid drying. When dry, vacuum to remove all acid/concrete reaction by-products and loosened aggregate.

Avoid any contamination of the etched surface and paint preferably within three days.