

## Cleaning Concrete Masonry

This guide aims to address the main issues surrounding the prevention and removal of mortar and grout from concrete masonry. Procedures for removing other common stains have also been covered.

### Good Blocklaying Practice

- Keep pallets of blocks and newly laid walls covered to prevent water saturation which can lead to efflorescence.
- Brush mortar from the face of blocks while laying and tooling before it sets hard.
- Any remaining 'dags' and mortar smears should be removed with hand tools and a bucket of water and brush. Care must be taken not to scratch the face of the blocks.

### Pressure Cleaning

Should only be considered after all 'dags' and thick smears have been removed with hand tools.

Before pressure cleaning:

- Mortar must harden for a minimum of seven days.
- A trial should be carried out:
  - to see if any damage to the face occurs;
  - to ascertain its effectiveness.
- The pressure used should not exceed 1000 psi at a rate not greater than 25 litres per minute.
- Only fan jets should be used.
- The jet should not be held any closer than 200 mm from the face of the wall.
- Holding the jet stationary can cause the surface of the block to be damaged.
- Mortar joints can easily be blown out if the above procedures are not followed.

### Caution:

*High pressure water blasting can cause personal injury.*



## Chemical Cleaning/Acid Treatments

Most mortar-removing chemical cleaners contain acid to help dissolve the cement in the mortar.

Concrete blocks are a cement-based product and hence acid treatments can often cause etching, fading and streaking on blockwork walls. Acids can also react with the oxides used in coloured-face masonry, changing their colour. For this reason, acid treatments should be used only as a last resort when other cleaning methods have failed.

Hydrochloric acid is very effective for dissolving cement mortar but is equally aggressive on the face of concrete blocks and hence must be used with great care. It should not be used at strengths greater than 1 part acid to 20 parts water. Milder acids like citric acid can be used at strengths of 1 to 10 parts water.

The following steps must be taken for acid cleaning:

- Any mortar dags or smears must firstly be removed by hand tools.
- Mask or protect adjacent areas from acid damage.
- The wall must be thoroughly saturated with water prior to the application of diluted cleaning solution.
- Apply the diluted cleaning solution with a brush or a broom starting at the top of the wall.
- Only small vertical strips of the wall should be treated at a time.
- Let the cleaning solution stay on the wall for between 2 and 5 minutes or as directed by the manufacturer.
- Wash the wall down to remove all the cleaning solution starting at the top of the wall.
- Repeat these steps until the desired result is achieved.

### Note:

Chemical cleaning is often used in combination with pressure cleaning. The pressure cleaners should not contain the cleaning chemical but should only be used to wet and wash down the wall.

Chemicals can cause harm to the operator and the environment and hence should be used only with care and to the manufacturer's recommendations.

Check the surrounding area for anything that might be damaged by cleaning solution and protect as necessary.

### Safety Warning:

*Never add water to acid, always add acid to water*

For more in-depth information on the cleaning and maintenance of concrete masonry refer to our publication *Concrete Masonry Structures – Cleaning and Maintenance*, which is available free to download from our website:

[www.cmaa.com.au](http://www.cmaa.com.au)

Also see our website for more technical information on concrete masonry, paving and retaining walls.



## Cleaning Other Stains

### Clay or Loam Stains

If water washing, with or without pressure cleaning, fails then a solution of 50 ml of household detergent and 500 grams of oxalic acid dissolved in 4 litres of warm water can be used. After pre-wetting the wall apply with a nylon brush. Rinse off and repeat as necessary.

### Timber (Tannin) Stains

Oxalic acid is used for the removal of hardwood timber stains. 120 gm of oxalic acid with 4 litres of warm water is the recommended mix. Apply on a wet surface and rinse off.

An alternative is to use chlorine solutions such as Sodium Hypochlorite (household bleach). These can be applied on to the dry surface. Repeat as necessary.

### Rust Stains

Phosphoric acid is used for the removal of iron-bearing deposits. A maximum strength of one part acid to 10 parts water should be used. Use only as directed above. Note that phosphoric acid can change the colour of coloured blocks as it reacts with the iron oxides.

### Efflorescence

The common cause of efflorescence is when newly-laid blocks are allowed to become saturated. Any free limes in the mortar and/or the blocks are dissolved into a solution which is brought to the face of the block when it dries. Good building practice can prevent this by covering all new work and keeping pallets dry.

Efflorescence, which appears well after a building has been completed, is caused by water entering the wall through poor or missing capping and flashings; non-ironed joints and/or on large exposed walls constructed from porous masonry blocks.

Dry brushing is the first method of removing the efflorescence. If this is not effective, water-washing techniques (as discussed) can be used. Chemical cleaning is the last alternative and must be used only as outlined above.

### Note:

If efflorescence reappears then the source of the water penetration into the wall must be addressed before any re-cleaning.

If an efflorescence problem is allowed to continue over time it will turn into calcium carbonate. Calcium carbonate is extremely hard to remove.