**SCOPE**
This data sheet sets out procedures for removing mortar smears, splatters or stains from surfaces such as clay masonry, concrete masonry, concrete, timber, plasterboard, aluminium and powder-coated finishes.

For advice on general cleaning and the removal of specific stains, see Data Sheets *Cleaning Concrete* and *Removing Stains from Concrete*.

**INTRODUCTION**
When laying masonry, adjacent surfaces should be protected from unintentional (but inevitable) mortar smears or splatters.

Depending on the element that may need to be protected, methods include plastic sheets, silicone and lubricant sprays and plastic tape to cover items such as aluminium door and window sills. If, despite precautions being taken, contamination does occur, it should be treated as follows:

- Newly laid masonry – allow the mortar to dry before attempting removal as set out below (attempting removal while the mortar is plastic will work it deeper into the surface, tend to spread it over a wider area and may damage new mortar joints).
- Existing masonry and other surfaces – wash the mortar splash off as soon as possible.

A number of proprietary cleaning products can be purchased from local hardware outlets. Many contain acids such as phosphoric, sulfamic, oxalic and one of the most common, hydrochloric (or muriatic) acid. These chemicals are hazardous and the precautions detailed below as well as recommendations by the suppliers should be followed.

Recently, some non-acidic (and thus safer) products that dissolve mortar have become available and these may be preferred to the traditional acid cleaning method to remove hardened mortar, particularly from non-masonry materials (eg painted finishes and glass) where removal of mortar by other methods may damage the surface.

**WHEN LAYING MASONRY,** adjacent surfaces should be protected from unintentional (but inevitable) mortar smears or splatters.
**USE OF ACIDS AND OTHER CHEMICALS**

Diluted hydrochloric acid, chlorine bleach, trisodium phosphate and other chemically-based cleaning agents can be hazardous. Always read the supplier’s instructions before use and follow their recommendations concerning safety and dilution rate. The following precautions are recommended:

- Wear suitable protective clothing at all times and work only in well-ventilated areas. Use fans to provide fresh air to the work area.
- Always add acid to water, not water to acid (when water is added to acid, the heat generated may cause the acid to splash out of the container).
- Do not mix hydrochloric acid with other chemicals as the reaction may also be violent and cause acid to splash out of the container.
- When using acids and other chemicals indoors extreme caution should be exercised to avoid damage to other materials and finishes.
- Always have a neutralising agent and source of water available. A readily available neutraliser is bicarbonate of soda mixed at the rate of 50 grams per litre of water. This can also be used for both the pre-wet and final rinse.
- Acids can etch concrete surfaces. Always try the proposed cleaning procedure and chemicals on a small area to begin with to assess the effects.
- Use only diluted acids and wash off immediately after use. Acids are typically diluted to a mixture of 1 part acid to 10–20 parts water for cleaning purposes. Stronger acid solutions may be more efficient at removing mortar smears but could result in salts being produced (as a by-product of the chemical reaction) which are even more difficult to remove.
- The substrate should be thoroughly saturated with water prior to the application of cleaning products such as acids to prevent them being absorbed into the material. Sufficient wetting is indicated when the surface no longer absorbs any water. The surface should be moist but without any free water present when the acid or chemical solution is applied.
- The suitability of acid cleaning should be considered for each situation as it may affect built-in components such as termite shields, brick ties, lintels and window/door frames.
- Dispose of effluent waste responsibly.

**CLAY MASONRY**

For existing clay masonry, any mortar splashes should be cleaned up before the mortar sets by washing with water and use of a stiff-bristled brush if required. Note that this method should also be effective for some hours after setting while the mortar is still weak/soft. In this case, any lumps or excess mortar should be removed from the surface prior to washing.

Once the mortar has hardened, any excess mortar, large mortar pieces or dags should be carefully removed from the surface with a hammer and chisel or scutch hammer. The mortar joints in new masonry walls should be left to cure for at least seven days before attempting to remove any residual mortar smear or staining from the masonry units.

Suitable methods for removing residual smears or staining from the surface of clay masonry units include:

- Hand washing with clean water, detergents and suitable proprietary cleaning compounds. The surface should be saturated with water prior to applying any cleaning chemicals and thoroughly rinsed off afterwards. The use of stiff-bristled or stainless steel brushes may be necessary.
- Pressure washing with water. When using high-pressure water cleaning on clay masonry, ensure the water pressure (maximum 7000 kPa), nozzle angle (minimum of 15 degrees) and distance of nozzle from the wall (minimum 300 mm but 500 mm preferred) do not cause damage to the surface, mortar joints and coatings/finishes.
- Acid cleaning by hand or pressure washing with water. Thoroughly wet the surface to prevent acid being absorbed into the surface, apply the dilute hydrochloric acid solution by hand using a fibre brush or by pressure cleaning equipment (as above) and scrub the surface if necessary with a stiff-bristled brush. The applied solution should be allowed to react on the mortar surface for only the minimum amount of time necessary: 10 or 15 seconds to a few minutes. The surface should then be thoroughly rinsed with clean water. Repeat rinsing at least twice or until all traces of the acid solution have been removed. In some situations neutralisation of the surface may be required.

**Note the following:**

- Ensure the acid content does not cause damage to the surface or affect surrounding fixtures and fittings such as brick ties and termite shielding, or runoff etch adjacent concrete (and other) surfaces.
- Acid cleaning should not be used for light-coloured or cream bricks as the acid can react with the colouring agents and cause green vanadium or brown manganese stains. The preferred method for these bricks is high pressure water washing.
- Extreme care should be used in cleaning brickwork with coloured mortars as acid washes may affect the tone of colour.
- Extreme care is required when handling acids and safety precautions as outlined above should be adhered to. Only skilled operators should be used.
CONCRETE MASONRY
For existing concrete masonry, any mortar smears/splatter should be cleaned up before the mortar sets by washing with water and use of a stiff-bristled brush if required. Note that this method should also be effective for some hours after setting while the mortar is still weak/soft. In this case, any lumps or excess mortar should be removed from the surface prior to washing. Never try to wipe wet or unset mortar splatter off the units as this will generally work the mortar further into the surface and spread the smear. If water washing is not an option, wait until the mortar has set then remove as much of the mortar as possible by dry brushing. Any staining can then be removed as detailed below.

Once the mortar has hardened, any large pieces or dags should be carefully removed from the surface with a hammer and chisel or scutch hammer, but water washing will probably fail to remove the remaining mortar smears. The mortar joints in new masonry walls should be left to cure for at least seven days before attempting to remove the residual mortar smears or staining from the masonry units.

Suitable methods for removing residual staining in increasing order of their potential to physically damage the surface of the concrete masonry units include:
- Dry clean the masonry using a stiff brush and rubbing with a piece of concrete masonry of the same colour as the wall. The wall should then be brushed and washed clean with water.
- Low-pressure (up to 1500 kPa) water blasting. With water blasting, use only fan jets at a distance greater than 300 mm from the surface and do not hold the jet stationary. The risk of damaging masonry units is low.
- Medium-pressure (1500–3000 kPa) water blasting improves cleaning ability but can cause damage to smooth-face masonry surfaces.
- High-pressure (3000–5000 kPa) water blasting further improves cleaning ability but can cause damage to both smooth and polished masonry surfaces. The risk of damaging split-face masonry surfaces is low for pressures less than 5000 kPa but increases for higher pressures.
- Stubborn mortar stains that still remain may be further treated by diluted acid cleaning as described for clay masonry. This will etch or remove the surface layer of concrete, along with any stains contained within it. The process should be trialled in a small inconspicuous area first to assess the effect on the surface finish.

To remove any remaining stains, the concrete may be further treated by acid cleaning as described for clay masonry. This will etch or remove the surface finish, and should minimise staining. Only fresh water and synthetic-bristled brooms should be used. Alternatively, specialist advice can be sought from the coloured concrete and sealer suppliers. Note that acid solutions may remove chemical sealer coats and may also result in a mottled surface.

CONCRETE
Mortar splatters on existing concrete surfaces such as driveways and paths should be promptly scraped up and the surface then washed down with clean water. This should ensure that there is little, if any, staining of the surface.

If coloured mortar is being used, some of the pigment used to colour the mortar may penetrate the surface and cause staining. The best approach is to thoroughly scrub and rinse the area, or possibly use high-pressure water to dislodge the particles from the surface.

To remove any remaining stains, the concrete may be further treated by acid cleaning as described for clay masonry. This will etch or remove the surface finish, and should minimise staining. Only fresh water and synthetic-bristled brooms should be used. Alternatively, specialist advice can be sought from the coloured concrete and sealer suppliers. Note that acid solutions may remove chemical sealer coats and may also result in a mottled surface.

TIMBER AND PLASTERBOARD
Mortar splatters on timber and plasterboard surfaces should be promptly scraped up and then the surface washed down with clean water. This should ensure that there is little or no staining of the surface. If any residual staining does occur or the surface is damaged by scraping off hardened mortar, painted surfaces can be sanded and repainted.
ALUMINIUM AND POWDER-COATED FINISHES
Aluminium and powder-coated surfaces should be protected against mortar splatters, for example by applying a silicon or lubricant spray or by a plastic sheet securely fixed in place. Any mortar splashes should be promptly removed by washing off. The silicon/lubricant coating should allow the mortar to be easily removed. If the coating is damaged during mortar removal and further protection is necessary, the coating can be reinstated.

GLASS
Glass surfaces should be protected by plastic sheet securely fixed in place. Never use steel wool or a wire brush to remove mortar from glass doors/windows or glass bricks as these may scratch the surface. If possible wash off with water before mortar sets or, if laying glass bricks, as soon as the mortar has set and water can be applied to the surface. Large lumps can be removed and any remaining mortar washed off with clean water. HARDENED mortar which has adhered to the glass can be carefully scraped off with a sharp blade or one of the proprietary non-acid-based products for softening/dissolving mortar can be used and any residue washed off using a soft brush and clean water.

BIBLIOGRAPHY
2 Concrete Masonry Structures – Cleaning and Maintenance (MA41) Concrete Masonry Association of Australia, September 2000.
3 Cleaning Concrete Masonry data sheet 2, Concrete Masonry Association of Australia.
4 Christine Beall Masonry and Concrete for Residential Construction McGraw-Hill.

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