

# THE LEADING PRACTICE GUIDE

Bricklaying and Cleaning

PGH BRICKS & PAVERS THINK BRICK

## GENERAL

Bricklaying and brick cleaning are separate but closely related activities. How cleanly the bricks are laid affects how easy it is to clean them later. Put simply, cleaner brickwork upfront leads to a smoother cleaning process. This guide outlines best practices for achieving optimal outcomes in both brick laying and cleaning.

### SCHEDULING FOR BRICK CLEANING

Mortar must be hardened prior to cleaning. It is generally best to schedule cleaning at least seven days after brickwork is completed. In some cases, it may be possible to clean earlier; however, effects on the masonry and influencing factors such as weather conditions and the type of brick and mortar should be carefully considered. If cleaning with water only (no chemicals added), cleaning may begin 24 to 36 hours after completion of brickwork.

For pressure cleaning, brick cleaners should be on site between 1 and 3 weeks after construction.

Builders and building supervisors need to avoid waiting too long between the completion of the masonry and cleaning. After one month, mortar smears and splatters left on brickwork become increasingly difficult to remove. It is good practice to schedule the brick cleaning service within the recommended time frames.

## RECOMMENDATIONS

### 10 DO'S

1. Clean as you lay the bricks.
2. Fully saturate the wall before applying solutions.
3. Wash off solution completely after cleaning.
4. Use clean water to clean the wall.
5. Set the solution on the wall for a set duration.
6. Point the hose at 15 degrees to the wall.
7. Use fanning action.
8. Test a small area before cleaning.
9. Protect adjacent materials.
10. Use a fan jet attachment.

### 10 DON'TS

1. Leave excessive mortar on brick face.
2. Apply solution when wall suction remains.
3. Leave solution on the wall.
4. Use contaminated or recycled water.
5. Leave the solution for too long.
6. Point the hose straight to the wall.
7. Focus on one point for too long.
8. Judge based on experience.
9. Leave adjacent materials unprotected.
10. Use turbo or rotary head attachments.

## 5 BRICKLAYING TIPS

### 1. RAIN PROOF

During construction, the top of the brick stack shall be covered to prevent rainwater entering the brickwork. This reduces the potential for future staining.



### 2. MORTAR CONSISTENCY

Mortar Additives - Lime shall be used in place of plasticisers to improve workability and durability without reducing the strength of mortar in accordance with AS3700 Table 11.1



Mortar Batching - To ensure that the correct proportion of materials has been used, batching shall be carried out using buckets instead of shovels.

### 3. CLEAN AS YOU GO

The more cleanly the bricklayer constructs the wall, the less difficult the cleaning task will be. By carefully laying the brickwork, it is possible to remove excess mortar from the joints before it stains the brick face. Such technique requires a certain degree of skill but will produce optimal results.



### 4. TOOLING AND DRY BRUSHING

After 5-10 minutes of the bricks/blocks being laid, the mortar will have sufficiently hardened, enabling excess mortar to be easily removed by tooling the mortar joints.



Dry brushing should then be used on the brick face to remove any hardened mortar stains. A few vigorous brushes during this time will make the subsequent brick cleaning task less difficult.

### 5. DRY SPONGING

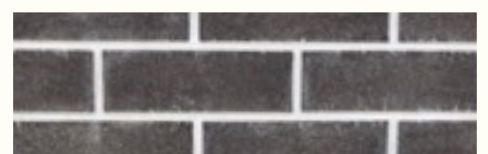
Never wet sponge the brick face as it will soften the mortar again, making it more difficult to remove. Dry sponging will remove most of the remaining mortar stains leaving the wall better prepared for future cleaning.



### FRESHLY LAID BRICKS



### VS BRUSHED AND DRY SPONGED BRICKS



5-10 minutes after being laid

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## PROCESS

### 1. SATURATE THE WALL

The entire wall area needs to be thoroughly saturated, exhausting the bricks suction capability before any application of chemicals. The recommended chemical strengths are based on fully saturated walls and failure to comply with this requirement stains developing and imperfections on the walls

### 2. APPLY CHEMICAL SOLUTION

Apply the chemical solution and let it stand for 1-5 minutes, unless advised otherwise for shorter application times. Prolonged standing may result in secondary staining. For dark-colored bricks, mix 1 part hydrochloric acid with 10 parts water.

For light-colored bricks, mix 1 part hydrochloric acid with 20 parts water. Always add acid to water to prevent splattering. Alternatively, consider using a proprietary green acid solution for a more environmentally friendly option, as they are gaining popularity for being less harmful than hydrochloric acid.

### 3. HOSE OFF

To guarantee the elimination of chemicals from the brickwork, it's crucial to thoroughly hose down the wall with water, ensuring complete washing. Avoid letting the chemical solution dry on the wall surface. Typically, treat an area of 2 to 6 square metres at a time.

### 4. NEUTRALISE

Following the acid wash, administer a neutralising solution comprising 65 grams of sodium bicarbonate per liter of water. This step should be completed within one hour of the acid treatment. Allow the solution to remain on the wall surface. Monitor the pH levels of both the wall and the water runoff at intervals to ensure they revert to neutral (pH 6.5 – 7.5). Clear runoff observed at the wall's base indicates thorough cleaning.

## PROCEDURE

1. **Saturate** the area thoroughly cleaning the wall with water.
2. **Remove** excess surface mortar with hand tools like a wooden paddle, brick, or chisel before applying water. Water or chemicals alone cannot remove large, hardened mortar particles.
3. **Once more, saturate** the wall thoroughly with clean water.
4. **Apply** appropriate cleaning solution when the suction of brick is exhausted.
5. **Allow** the chemical solution to react for a controlled period.
6. **Wash** the wall with high pressure water from top to bottom. The maximum pressure should range between 1000 psi to 1200 psi, and the spray angle should be 15 degrees along with a fanning action. The jet should be 500 mm away

from the wall and never closer than 300 mm, and the width of a run is usually 1 - 1.2 m. See the image below.

7. **Repeat** the washing process if necessary. Follow steps 3 to 6.
8. **Rinse** loose sand and dirt from the eaves, walls, and windows. Check the need for further cleaning when the wall is dry.
9. **Neutralise** the area. While rinsing, observe the runoff's appearance. Clear runoff at the wall's base signals sufficient rinsing. Additionally, periodically test the pH of the wall surface and runoff water using pH paper to ensure both return to neutral (pH 6.5 to 7.5). Further rinsing is necessary if the pH deviates beyond these ranges in either direction.



## PRECAUTIONS

### FOR BRICK CLEANING

- Turbo or rotary head attachments are to be avoided as they can damage the brickwork.
- A small area should be test cleaned for the cleaning method proposed; normally the bottom corner or other less noticeable areas are used for the test.
- Adjacent materials must be masked or otherwise protected as recommended by manufacturers.

- Vanadium stains need to be identified prior to chemical application to avoid the brick turning black from chemical reaction.
- High pressure jetting is strictly prohibited as it causes damage to the operator and surroundings of the wall.
- Never use a straight water jet as it damages the brick face.

### FOR STAIN REMOVAL


- Phosphoric acid is suitable for small areas/ amounts only. Excessive use may cause staining, necessitating the application of hydrofluoric acid for removal.
- Hydrofluoric acid has the capacity to etch glass and pose serious harm. Inhalation or skin contact can be fatal. Always use suitable PPE.
- Agitating cleaning chemicals or acids with a stiff nylon brush can aid in removing severe or stubborn stains.

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## STAIN REMOVAL

Stain	Appearance	Description	Common Cause	Solution	Solution Strength
Efflorescence		A powdery deposit of salts which are usually white, but can be yellow, green or brown.	Soluble salts are transported to the surface of the brickwork by water	Dry brushing and damp cloth If efflorescence persists, use phosphoric acid or a proprietary green acid	1 part Phosphoric Acid : 15 parts Water <hr/> 1 part Green Acid : 10 parts Water
Iron Oxide Stain (Acid Burn)		A yellow, orange to brown rust-like stain	Unsaturated wall; overly concentrated acid; impatient practice	Phosphoric Acid  Oxalic Acid	1 part Phosphoric Acid : 6 parts Water <hr/> 20-40g Oxalic Acid : 1 L Water
Calcium (Carbonate)		Insoluble white vertical deposits, thickens over time	The setting reaction of portland cement with carbon dioxide from the air	Hydrochloric Acid  Phosphoric Acid	1 part Hydrochloric Acid : 10-20 parts water (dependent on brick colour) <hr/> 1 part Phosphoric Acid : 8 parts Water
Calcium (Silicate)		Insoluble thin milky film, invisible when wet	Reaction of clay from the mortar with calcium; silica residues from the cement	Hydrofluoric Acid  Proprietary Green Acid	1 part Hydrofluoric Acid : 4 parts Water <hr/> 1 part Green Acid : 2 Parts Water
Vanadium Stains		A yellow-green discoloration	The vanadium salts naturally present in most clay materials used to produce light coloured bricks	Sodium Hypochlorite (found in bleach or pool chlorine)  Potassium or Sodium Hydroxide  Oxalic Acid	150g Potassium or Sodium Hydroxide : 1 L Water <hr/> 20-40g Oxalic Acid : 1 L Hot Water
Manganese Stains		A dark blue-brown discoloration	Grey or brown coloured bricks with the addition of manganese during manufacture	Acetic Acid (80% or stronger) and Hydrogen Peroxide (30-35% strength)  Phosphoric Acid	1 part Acetic Acid : 1 part Hydrogen Peroxide : 6 parts Water <hr/> 1 part Phosphoric Acid : 3 parts Water
Petroling Stain		Light refracting with many colors, mainly purple with blues and browns	A very thin layer of silica formed on brick	Degreasing Agent, agitation may be required	1 Part Degreasing Agent : 10 Parts Water

\*Reference: Think Brick Manual 13: Clay Masonry Cleaning Manual (2019), Think Brick Australia. | Cover Photo: Grey Street House, Local Architecture, photography by Dion Robeson.