

# Brickwork Design Profile

## Cleaning New Brickwork

### Introduction

The development of new face brick colors and textures has brought about changes in materials and methods used for cleaning new brick walls.

This profile is a capsule report of the cleaning methods currently being used, and is a guide to cleaning most types of brick.

The final appearance of a finished brick wall often may depend as much on the proper cleaning as the excellence of workmanship or the quality of materials used. Proper cleaning of brickwork brings out the natural beauty and color while avoiding the dull appearance caused by smeared mortar, job dirt, improper rinsing or the use of an incorrect cleaning agent.

The information and recommendations which follow are based on our own research and the research and experience of others, and are believed to be accurate. No guarantee of the results is made because we cannot address every possible application of the products described, nor anticipate variations encountered in masonry surfaces, job conditions and cleaning methods used. It is essential that cleaning methods and chemicals be tested before general application.

### General Recommendation

Although many methods are available for cleaning masonry walls, this profile deals with bucket and brush cleaning — the most widely used method of cleaning newly constructed brick walls on both small and large jobs. This method may be used for cleaning most colors and textures of brick.

Care must be used in selecting the proper cleaning chemical for the job. The safest way to determine the proper cleaning chemical for a given type brick is to ask the manufacturer of the brick for their recommendation.

**Do not use muriatic acid!** Although muriatic acid has been used for many years for cleaning brick walls, its use is not recommended by Glen-Gery because it usually damages the mortar joints, because it is often applied in the wrong dilutions and because it is often applied to other than red brick. Some types of brick — buffs, browns, greys, yellows and blacks — can be damaged by contact with muriatic acid. While Muriatic acid is readily available and cheap (not economical), it should **not** be used to clean brick or block masonry. Many commercial cleaning compounds are marketed today which

will clean new masonry better than muriatic acid and which can be used with great safety. Many of these cleaners contain “wetting” and “buffering” agents to improve the action of the solution and to minimize deterioration of mortar joints. Some of the commercial cleaning compounds we recommend are SureKlean\* #600, SureKlean Vana Trol, and Diedrich #202 and #202V. Apply all commercial cleaning compounds in strict accordance with the manufacturer’s written instructions. All masonry cleaning chemicals are potentially dangerous and appropriate personal

### A Few Preventative Tips

While it’s true most new brickwork requires some cleaning, the subject of cleaning masonry might best be preceded by a few tips on building clean brick walls.

- 1) Bricks should not be placed directly on the ground at the job site. Protective material should be provided when brick are unloaded. In the case of white, buff, yellow, grey, brown, black or chocolate bricks, complete protection should be provided until used.
- 2) Protect the wall as work progresses. This includes protecting the base of the wall after the first course of brick is laid and protecting the wall from rain and snow to keep excessive water out of the wall. Cover the tops of walls and window and door sills at the end of each day’s work. It is particularly important to protect sills after the windows have been set but not caulked.
- 3) Scaffolding should be set far enough away from the wall to allow mortar drippings to fall to the ground. At the end of each workday the scaffold boards closest to the wall should be tilted up to dump excess mortar droppings and prevent rainfall from splashing mortar onto the masonry.
- 4) Remove excess mortar with stiff bristle brushes or wood or plastic scrapers as the work progresses.
- 5) Sand and water used in the mortar should be free of mud, salts and debris which may cause efflorescence or staining. If you won’t drink the water, don’t put it in the mortar mixer!

protective equipment must be worn. Protect nearby materials from damage. All masonry cleaning chemicals must be tested before general application.

### **Never sand blast brick masonry.**

Regardless of the aggregate used — sand, nut shells, bicarbonate of soda — never use wet or dry sand blasting techniques to clean new or old brick masonry.

\*SureKlean Reg. T.M. ProSoCo, Inc.

## **Cleaning Guide**

Ask the manufacturer of the brick for the name of the chemical they recommend to clean the specific brick being laid. Do not use the cleaner listed in the project specification until you have confirmed this choice with the brick manufacturer.

Confirm the following cleaning suggestions with the manufacturer of the brick that you are using.

### **Red Brick – Smooth and Textured**

This category includes most smooth and textured red through-the-body-color brick. Brick in this category may be cleaned by the bucket and brush method, or bucket and brush and pressure rinse (1000 psi maximum) method. Chemicals such as SureKlean #600 and Diedrich #202 are commonly used

### **Red Brick – Sand Finish and Some Applied Finishes**

This category includes most through-the-body brick with various sand finish faces and certain applied finishes. Brick in this category may be cleaned by the bucket and brush method, or bucket and brush and pressure rinse (100 psi maximum) method. Chemicals such as SureKlean #600 and Diedrich #202 are commonly used.

### **White, Buff, Tan, Grey, Black and Chocolate Brick**

This category includes all smooth, textured, and sand finish brick and bricks with surface and through-the-body colors other than natural red. Brick in this category may be cleaned by the bucket and brush method.

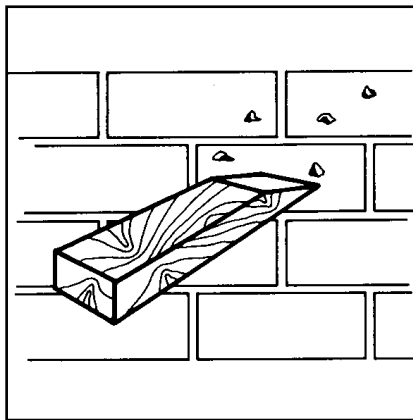
**Do not use muriatic acid, SureKlean #600, or Diedrich #202**

**to clean these bricks. Use of these chemicals may cause vanadium stains, manganese stains, or other metallic stains.** Special chemicals such as SureKlean Vana Trol or Diedrich #202V may be used. Pressure rinsing may be used if the pressure is adjusted to suit the specific finish.

## **Bucket and Brush Method**

1) While industry standards generally require masonry to be seven days old before cleaning, it is possible to start cleaning operations 24 to 36 hours after completion of brickwork, depending on the type of mortar and weather (drying) conditions. As a general rule, cleaning of Type S Portland cement and hydrated lime mortars should begin within 48 hours. Cleaning of Type N Portland cement and hydrated lime mortars should wait for seven days to allow the mortar to cure and then be completed within 14 working days. The longer the wait, the more difficult it is to remove mortar smears. Old Portland cement-lime mortar smears are very difficult to remove. Cured latex-modified mortars are nearly impossible to remove.

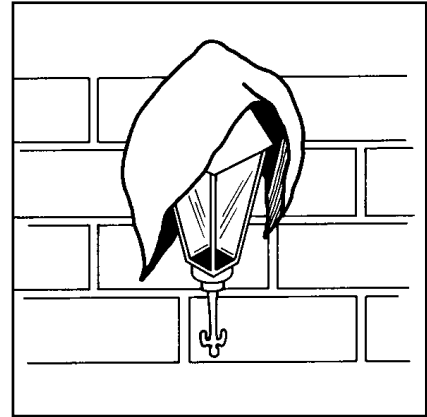
2) Select a cleaning agent approved by the brick manufacturer. Concentration of the mixture and method of application should be as recommended in the written instructions of the manufacturer of the cleaning chemical, subject to result of test applications.



3. Remove large particles.

3) Remove all large mortar particles before applying water or cleaning solutions. Use wooden paddles or broken bricks to remove hardened mortar or concrete. This is a very important point in cleaning new masonry. Acting alone, cleaning chemicals cannot remove large particles of hardened mortar. Never use metal tools — ice scrapers, putty knives or wire brushes, always use plastic or wooden tools or broken bricks. Never use metal containers to mix cleaning chemicals; use plastic containers. Cleaning will be much easier if the excess mortar is

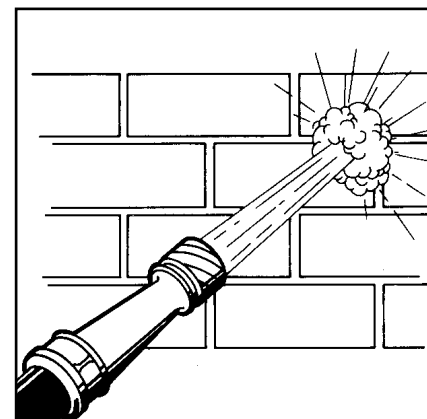
brushed from the walls or paving at the end of each day's work or at the end of each shift.



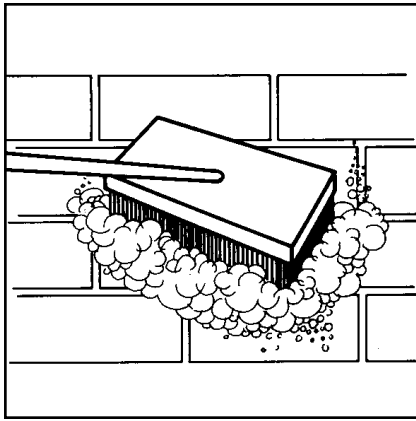
4. Protect areas.

4) Mask and otherwise protect adjacent materials as recommended by the manufacturer of the cleaning chemical. If possible, clean the masonry before the windows, door frames, louvers, light fixtures, hose bibs, and other metal objects have been installed.

5) Pre-wet! Pre-wet! Pre-wet! Saturate the wall with clean water. The area to be cleaned must be saturated as well as all masonry below. Failure to saturate the surface of the wall is a major cause of damaged masonry. When the masonry is not saturated, cleaning solutions and cleaning solutions containing dissolved mortar particles will be drawn into the masonry, causing scumming and staining. Scumming from Portland cement or cleaning chemicals is extremely difficult to remove.



5. Saturate wall.

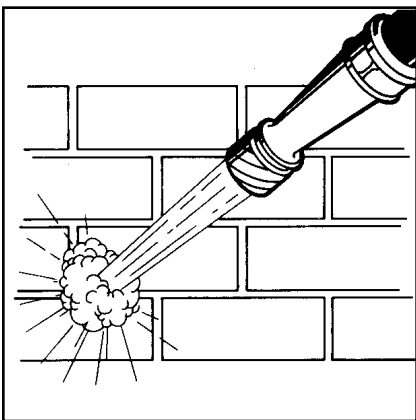


6. Apply cleaning solution.

6) Working from the top down, apply cleaning solution to the surface-saturated wall with a stiff fiber brush. Cover a small area, using long handle brushes. Never use a wire brush. Scrub brick, not joints. Allow the solution to remain on the wall for the time recommended by the chemical manufacturer. Do not allow the cleaning solution to dry on the wall. If the wall starts to dry, reapply the cleaning solution. Keep the wall below the area being cleaned saturated with clean water to keep chemicals and debris from being drawn into the masonry.

NOTE: "Clean" water is water that you are willing to drink.

- 7) Reapply the cleaning solution. Scrub to remove the last bits of mortar.
- 8) Rinse thoroughly. To avoid rapid evaporation of water on areas being cleaned, keep the crew just ahead of sunshine. These are ideal conditions for cleaning the wall, allowing the wall to dry soon after being washed and permitting the crew to see if all stains have been removed before going too far ahead.



8. Rinse thoroughly.

## Specialty Cleaning

### White Efflorescence

White efflorescence is a water soluble salt that is brought to the surface of masonry — bricks and mortar — by evaporation of construction water or by evaporation of rain water that has penetrated the wall or some other building system.

The necessarily high water content of mortars and, particularly, grouts will sometimes cause "new building bloom". As the wall dries out, and as successive rains wash the wall, the "bloom" should disappear. The building must be closed and the heating or cooling system must be in operation before significant drying can occur.

If the masonry has received its regular cleaning and white efflorescence appears or reappears, no further action should be taken until the wall has had an opportunity to dry. Recleaning the masonry forces more water into the masonry and will only aggravate the problem. Application of clear water repellent chemicals at this time may trap salts within the masonry, causing subfluorescence and spalling of masonry units.

If efflorescence stains persist, it is likely that rainwater is penetrating the wall or some other building system. A thorough inspection of the structure should be made to determine the source of the water infiltration.

### Green Stains (Vanadium)

Green, brown, and/or yellow stains may occur following the cleaning of buff-bodied bricks or after long exposure of bricks in cubes to acidic rains. These stains are usually caused by vanadium compounds which are natural ingredients of clay and shale.

It is possible for stains to develop if excessive moisture — particularly acidic rains — is permitted to get into the brick body just prior to its use or during the construction period. Vanadium stains usually develop after these light colored brick has been cleaned with muriatic acid or a proprietary cleaner such as SureKlean #101, SureKlean #600, or Diedrich #202. Only chemicals such as SureKlean Vana Trol or Diedrich #202V may be used for the initial cleaning of light-colored brick.

If green, brown, or yellow stains develop after initial cleaning, consider the following:

- 1) **Do not apply SureKlean Vana Trol or similar chemicals!**

Reapplication may only increase the severity of the problem.

- 2) Use SureKlean #800 to attempt to remove the stains. SureKlean #800 is a dangerous chemical; avoid direct contact with the skin. Wear protective clothing. Caution should also be used to prevent splashing the solution. Eye protection is particularly important.
- 3) Before beginning general cleaning, clean test areas to determine the proper dilution and cleaning technique. Follow the instructions provided by ProSoCo, Inc.
- 4) When the wall is thoroughly dried out and the outdoor temperatures is above 50°F (10°C), apply SureKlean 800 stain remover with a soft fiber brush or sponge in accordance with the results of the test program. Scrubbing is generally not necessary.
- 5) Allow the solution to remain on the wall 10-15 minutes or until the stains have disappeared, then rinse with clean water.

### Brown Stains (Manganese)

Manganese staining (tobacco juice stain) is the result of precipitation of manganese compounds in the mortar. Despite the very low solubility of manganese, minute amounts of manganese might be dissolved by acidic cleaning solutions or acidified rain water. Contact between these acidic solutions and the alkaline mortar results in a brown salt forming in the mortar joint. The stronger the acid or the larger the amount of moisture penetrating the wall, the greater will be the staining.

*Do not clean brick containing manganese with muriatic acid, SureKlean #101, SureKlean #600, Diedrich #202, or similar chemicals.* Use specialty cleaners such as SureKlean Vana Trol or Diedrich #202V. After cleaning, the wall should be rinsed down very thoroughly to remove any residue. Where the amount of rinse water is limited, the final rinse should be done with a neutralizing solution such as 2 tablespoons of potassium or sodium hydroxide (lye) per 1 gallon of water.

Should staining occur after initial cleaning, do not apply SureKlean Vana Trol or similar chemicals. This usually increases the severity of the problem. The stains often can be removed by applying SureKlean #800. Persistent staining may require the use of SureKlean Ferrous Stain Remover.

### White Scum

Insoluble white scum is generally caused by faulty cleaning, particularly failure to saturate the wall before cleaning or allowing the cleaning compound to dry on the wall. As opposed to white efflorescence, this stain cannot be removed with detergents or regular cleaning compounds. Try SureKlean White Scum Remover. Follow the directions on the label.

### Smoke Stains

Smoke Stains can generally be removed by using SureKlean Restoration Cleaner or SureKlean Smoke Remover.

### Mud Stains

Mud stains are the most difficult of all stains to remove. The best method of removal is prevention. Sometimes SureKlean Restoration Cleaner is helpful.

### A Word About Cleaning Masonry Laid With Colored Mortar

While the selection of a cleaning system is usually determined by the type of brick to be cleaned, this changes when a colored mortar is used. Most manufacturers of colored mortars, including Glen-Gery, do not recommend use of regular masonry cleaning materials on their products. Since many cleaning chemicals will bleach colored mortars, only specialty cleaning products such as SureKlean Vana Trol or Diedrich #202V are recommended for cleaning masonry laid with colored mortars.

### What About Different Types of Bricks in One Wall?

When there are two or more kinds of brick in one wall, the wall must be cleaned with the chemical which will damage none of the brick. This chemical is often SureKlean Vana Trol or Diedrich #202V.

Any cleaning system is somewhat unpredictable in its action and should be tested on a sample panel before proceeding with the cleaning job.

Technical information contained herein is based on reliable sources.

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