

**Alcoa Home Exteriors**  
**Field Guidelines For Warranty Claims**  
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**CLEANERS & SIDING MAINTENANCE**

**Armor All® “Protectants” – Do Not Use**

The recommendation from R&D is not to use this product on Rigid PVC/GELOY topcap. If Armor All® had thought there was any validity in this product for siding they would have pushed for approval from VSI along with their vinyl siding cleaner (see siding cleaners listed below). VSI never did endorse the cleaner and neither did AHE. We recently received a copy of an emailed letter sent to a consumer regarding the use of the Protectant that confirms our cautionary statement.

Dear Ms. Foster:

Thank you for contacting us about ARMOR ALL Protectant. We appreciate your interest in our product.

The ARMOR ALL Protectant is a water based silicone emulsion specifically designed to protect and beautify polymeric materials such as rubber, plastics, vinyl and automotive-grade finished leather. Unfortunately, this product is not recommended for vinyl siding.

I hope this information is helpful. Again, thank you for contacting us.

David N. Mills  
Product Specialist

**Note: In the VSI Vinyl Siding Cleaning & Maintenance Guide Armor All® is listed under the vinyl siding cleaners, but this refers to the vinyl siding cleaners only (see below).** The following information was copied from the Armor All® website.

**Armor All® Vinyl Siding Wash Kits and Refills**

Household detergents and cleaners are not designed for vinyl siding. Plain water won't remove those tough stains. That's why Armor All® Vinyl Siding Wash was created. This safe, effective formula is designed specifically for vinyl siding. Vinyl Siding Wash coats the vinyl to dissolve and lift tough spots caused by bird droppings, dirt, grime and algae. Armor All® Vinyl Siding Wash quickly carries off the dirt to reveal vinyl siding so clean, your house will be the talk of the block.



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**Armor All® Concentrated Siding Wash Pressure Washing Formula**

Armor All® Pressure Washing Formula for Siding is exclusively formulated for cleaning siding with a pressure washer. Armor All® Concentrated Siding Wash is safe for exterior vinyl and painted wood surfaces. It helps remove tough stains from dirt, mold, algae, and bird droppings.

Armor All® Concentrated Siding Wash is for use on painted fences, vinyl siding, painted wood siding and decorative trim. It is safe for all high-pressure washers when used as directed.

Please note that neither of the vinyl siding cleaners have been tested by AHE.

**Mildew Check**

Six types of siding products were subjected to a solvent test using Mildew Check mildew remover. No discoloration or other damaging effects were observed on any of the panels tested, as a result of contact with Mildew Check. After permitting the Mildew Check to dry, a dullness or white cast was observed on some of the panels; in each case, this residue was removable by rinsing with water.

**Conclusions:**

- No negative effects are expected when Mildew Check is used on any of the product types included in this test.
- Mildew Check can be expected to leave a white residue, which is removable by rinsing with water. The level of visibility of this residue may vary depending on the color of the panel.

**Bug Spray Test Results on Vinyl Siding**

AHE has been conducting a series of tests on various bug sprays to determine if they will stain vinyl siding products.

Products that do not stain:

- Raid Wasp and Hornet
- Ortho Hornet and Wasp
- Ortho Outdoor Insect Fogger
- Ortho Ant Stop
- Hot Shot Ant Killer Plus
- Hot Shot Spider Killer Plus (did NOT attack the GELOY.)
- Spectracide Grass and Weed Killer

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Products that do stain or leave white spots:

- Revenge Fly Bomb
- Off Unscented
- Round Up Weed & Grass Killer (Very slight stain)
- Armor Deck Protector
- Backwoods Cutter (Attacked all of the panels to some degree. Of particular note is the LFP panel, on which the film became crinkled or cracked.)
- Hot Shot Flying Insect Killer 2 Plus (whitish streaks)
- Hot Shot Yard Fogger 2 (some whitening)
- No Pest Malathion 50 Insect Spray (light stains)
- Spectracide Bug Stop (heavy stains)

We would make the following recommendations:

- Avoid using, or be careful when using, products containing the compounds listed above near siding.
- If any product is sprayed onto siding, wipe off the excess, and then rinse the area of siding thoroughly with water. Areas on the test panels, which were rinsed off showed lighter damage, or none at all. Wiping off the excess is recommended to minimize spreading the material to other panels during rinsing.

The above information does not represent an endorsement of the listed products, but is based on actual tests performed in a laboratory environment.

**PROCON Graffiti Remover**

Alcoa Home Exteriors has tested the effects of a graffiti remover product called PROCON. As noted below it can be used on certain products with no damaging effects. According to the label it will remove paint, ink, lipstick, magic marker, crayon, shoe dye and shoe polish on vinyl and aluminum siding.

**Warning:** There are other graffiti remover products on the market that we have not tested and are different in formulation from PROCON. Although we do not endorse the product it is important to tell the customer the name of the product tested.

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**Objective: Perform solvent tests on various siding products using PROCON Graffiti Remover.**

**Sample Description**

The PROCON Graffiti Remover was tested on the following products:

- Victorian Grey MC40 (9116662D2): PVC topcap
- American Walnut LFP40 (0015145D1): LFP film
- Pebblestone Clay BW50 (9273631N2): GELOY topcap
- Harbor Grey Cedar Discovery: polypropylene
- Pine Needle QT40 (0104163N2): dark color film
- Weathered Ash QT40 (date code unknown): skeleton film
- LP Norman Rockwell Mahogany: acrylic topcap

**Conclusions:**

- No negative effects are expected when PROCON is used on traditional PVC products, polypropylene, or PVDF films. (The rise in gloss on PVC, PP, and PVDF film can be expected to disappear within 24 hours.)
- PROCON Graffiti Remover can be expected to damage the appearance of GELOY, skeleton film and acrylic-based products.

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**VSI Cleaning and Maintenance Guide**

VINYL SIDING IS DURABLE, ATTRACTIVE, AND EASY TO MAINTAIN. LIKE ANY OUTDOOR PRODUCT, HOWEVER, EVEN LOW MAINTENANCE VINYL SIDING WILL NEED ATTENTION FROM TIME TO TIME. DON'T WORRY! SIMPLY FOLLOW THE CLEANING AND MAINTENANCE TIPS IN THIS BROCHURE AND YOUR VINYL SIDING WILL ALWAYS LOOK ITS BEST.

**CLEANING**

**HOW DO I WASH VINYL SIDING?**

Wash vinyl siding with a soft cloth or ordinary long-handled, soft bristle brush. For textured surfaces, use only a soft bristle brush to avoid smearing stains into the grooves of the texture. To prevent streaking from soap and water running down the house during cleaning, start at the bottom of the house and work up. Rinse the cleaning solution with water before it dries. If your house has brick facing, cover the brick so that it is not affected by the runoff.

**CAN I USE A POWER WASHER?**

Yes, though you should read the washer instructions thoroughly before use. When cleaning, hold the power washer straight at eye level. Do not aim the power washer upward, as the water may collect behind the siding, leak later, and produce streaks or could remain and cause decay.

PSI for pressure wash can be up to 2,400 using a 40-degree tip. **Never** use a 0 degree tip. **Follow washer instructions very carefully.**

**HOW DO I REMOVE MOLD AND MILDEW?**

Small spots of mold and mildew can be handled with cleaners such as Fantastik® or Windex®. For larger sections, a solution of vinegar (30%) and water (70%) has proven successful. Alternatively, you also could try the following solution: 1/3 cup (2 2/3 ounces) powdered laundry detergent (e.g., Tide®, Fab®, or equivalent), 2/3 (5 1/3 ounces) cup powdered household cleaner (e.g., Spic & Span®, Soilax®, or equivalent), 1 quart (32 fluid ounces) liquid laundry bleach, and 1 gallon (128 fluid ounces) of water.

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**WHAT TYPES OF CLEANERS SHOULD I USE FOR OTHER STAINS?**

A list of commonly accepted cleaners is provided in the box below. Be sure to spot check any general or stain specific cleaner before using it on a large section of siding. After removing the stain, rinse thoroughly with water. Do not use cleaners containing organic solvents, undiluted chlorine bleach, liquid grease remover, nail polish remover, or furniture polish or cleaners. They can affect the surface of the siding.

**MAINTENANCE**

**HOW CAN I PROTECT VINYL SIDING FROM DISCOLORATION?**

Cover vinyl siding when using stains, sealants, and wet concrete as part of home renovation projects. To avoid potential staining from insecticides or herbicides, consult the product labels and/or the insecticide or herbicide manufacturer before applying.

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**VINYL SIDING CLEANERS**

General cleaners (e.g., Simple Green®, Nice & Easy®, Armor All®, etc.) can be used to clean dirt, bird droppings, and spider webs. Stain-specific cleaners are listed below. Rinse all cleaners with water before they dry.

**Stain**

**Cleaners\***

Bubble Gum water	Fantastik®, Murphy Oil Soap®, solution of vinegar (30%), (70%), and Windex®
Crayon	Lestoil®
DAP (oil-based caulk)	Fantastik®
Felt-tip Pen	Fantastik®, water based cleaners
Grass	Fantastik®, Lysol®, Murphy Oil Soap®, Windex®
Lithium (car) grease	Fantastik®, Lysol®, Murphy Oil Soap®, Windex®
Motor Oil	Fantastik®, Lysol®, Murphy Oil Soap®, Windex®
Paint	Consult paint manufacturer's cleanup instructions, Brillo
Pad®, Soft Scrub®	
Pencil	Soft Scrub®
Rust	Fantastik®, Murphy Oil Soap®, Windex®
Tar	Soft Scrub®
Top Soil	Fantastik®, Lestoil®, Murphy Oil Soap®

\*Cleaners are listed in alphabetical order

VSI does not endorse products or processes and makes no warranties for the product referenced herein. Reference to proprietary names is for illustrative purposes only and is not intended to imply that there are not equally effective alternatives.

**HOW DOES HEAT AFFECT VINYL SIDING?**

Vinyl siding is made from organic materials and will melt or burn when exposed to a significant heat source. Home and building owners should always take precautions to keep fire sources (e.g., barbeque grills) and combustible materials (e.g., dry leaves, mulch, trash) away from vinyl siding.

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**HOW DOES REFLECTED LIGHT AFFECT VINYL SIDING?**

The typical heat distortion temperature of vinyl siding is approximately 160 to 165 degrees Fahrenheit. When temperatures reach these levels, the siding is likely to distort. Reflected or radiated heat sources include windows, roofing, pavement, and certain underlayments. Installing screens and awnings and planting bushes or other landscaping can alleviate reflection or radiation.

**WHAT SHOULD I DO IF A PANEL IS DAMAGED?**

If a vinyl siding panel is permanently stained or otherwise damaged, it is easily replaceable. Place an “unlocking” tool behind the bottom of the panel above the panel to be replaced and unzip it from the lock of the damaged panel. Gently bend out the upper panel and remove the nails from the damaged panel. Remove the damaged panel. Lock on the new panel and nail it up. Use the unlocking tool again to zip the upper panel over the lock on the new panel.

**CAN I PAINT VINYL SIDING?**

Consult with your vinyl siding manufacturer before painting vinyl siding. Many manufactures void their warranties if the siding is painted.

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**BIA Brick Cleaning Guide**

The Brick Industry Association provides the following information, related to the cleaning of brick products. Web-site [http://www.brickinfo.org/html/frmset\\_thnt.htm](http://www.brickinfo.org/html/frmset_thnt.htm)  
Note: We have not tested any of the processes listed.

**Technical Notes 20 - Cleaning Brick Masonry Rev [Nov. 1990]**

**Abstract:** This *Technical Notes* addresses cleaning new buildings, removal of green (vanadium) and brown (manganese) stains, removal of stains from external sources and cleaning existing and historic buildings. Procedures included, if followed with good judgment, should result in successful applications of cleaning brick masonry.

**Key Words:** brick, **cleaning**, **efflorescence**, existing masonry, historic structures, new masonry, **stains**.

**INTRODUCTION**

The final appearance of a brick masonry wall depends primarily on the attention given to masonry surfaces during construction and the cleaning process. Many of the problems of brick masonry, brought to the attention of the Brick Institute of America over the past years, have resulted from improper cleaning methods. Some walls have been irreparably damaged as a result of a lack of attention to cleaning details and procedures.

Cleaning failures generally fall into one of three categories:

1. Failure to thoroughly saturate the brick masonry surface with water before and after application of chemical or detergent cleaning solutions. Dry masonry permits absorption of the cleaning solution and may result in "mortar smear", "white scum", or the development of efflorescence or "green stain". Saturation of the surface prior to cleaning reduces the absorption rate, permitting the cleaning solution to stay on the surface rather than be absorbed.
2. Failure to properly use chemical cleaning solutions. Improperly mixed or overly concentrated acid solutions can etch or wash out cementitious materials from the mortar joints. They have a tendency to discolor masonry units, particularly lighter shades, producing an appearance frequently termed "acid burn" and can also promote the development of "green" and "brown" stains.

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3. Failure to protect windows, doors, and trim. Many cleaning agents, particularly acid solutions, have a corrosive effect on metal. If permitted to come in contact with metal frames, the solutions may cause pitting of the metal or staining of the masonry surface and trim materials, such as limestone and cast stone.

**GENERAL**

Before the actual cleaning of a project begins, all cleaning procedures and solutions should be applied to a sample test area of approximately 20 sq. ft. (1.9 m<sup>2</sup>). The effectiveness of the cleaning agent should be judged by inspection of the sample test area after a period of not less than one week after application. The size of the test area may be larger, depending upon the cleaning procedure. The indiscriminate use of muriatic acid or the wrong proprietary compound can cause unsightly, difficult-to-remove stains. Reactions of brick and cleaning solutions are not always predictable and thus it is safer to use a trial-and-error method on a small test area before committing the entire project to a set procedure. Minute quantities of certain minerals found in some fired clay masonry units and materials, such as manganese, added to color brick may react with some solutions and cause staining. Sample testing should be performed under conditions of temperature and humidity that will closely approximate the conditions under which the brickwork will be cleaned. Chemical cleaning solutions are generally more effective when the outdoor temperature is 50 °F (10 °C) or above.

It is always advisable for the mason to keep the brickwork as free from mortar smears as possible. However, in modern construction, where speed is important, even the most skilled of bricklayers may find this difficult. Some general precautions that can be taken to promote a cleaner wall are as follows:

1. Protect the base of the wall from rain-splashed mud and mortar splatter. Use straw, sand, sawdust, or plastic sheeting spread out on the ground, extending 3 to 4 ft. (0.9 to 1.2 m) from the wall surface and 2 to 3 ft. (0.6 to 0.9 m) up the wall.
2. Scaffold boards near the wall should be turned on edge at the end of the day to prevent possible rainfall from splashing mortar and dirt directly on the completed masonry.
3. Cover walls with a waterproof membrane at the end of the workday to prevent mortar joint wash out and entry of water into the completed masonry.
4. Protect site stored brick from mud. Store brick off the ground under protective covering.

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5. Careful workmanship should be practiced to prevent excessive mortar droppings. Excess mortar should be cut off with the trowel as the brick are laid. Joints should be tooled when "thumbprint" hard. After tooling, excess mortar and dust should be brushed from the surface. Avoid any motion that will result in rubbing or pressing mortar particles into the brick faces. A medium soft bristle brush is preferable.

**CLEANING NEW MASONRY**

**General**

Table 1 should be referred to as a general cleaning guide for new masonry. Present cleaning methods for new masonry may be classified into three categories: 1) Bucket and Brush Hand Cleaning, 2) Pressurized Water Cleaning, and 3) Sandblasting. Some chemicals or chemical compounds used to clean brickwork and the resulting fumes may be harmful. Protective clothing and accessories, proper ventilation and safe handling procedures must be exercised. The use and disposal of some chemicals or chemical compounds are regulated by federal, state or local laws and should be researched before use. Manufacturer's material and handling requirements should be strictly observed.

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**TABLE 1**  
**Cleaning Guide for New Masonry**

<b>Brick Category</b>	<b>Cleaning Method</b>	<b>Remarks</b>
Red and Red Flashed	Bucket and Brush Hand Cleaning  Pressurized Water  Sandblasting	Proprietary compounds, hydrochloric acid solutions, and emulsifying agents may be used.  <i>Smooth Texture:</i> Mortar stains and smears are generally easier to remove: less surface area exposed; easier to presoak and rinse; unbroken surface, thus more likely to display poor rinsing, acid staining, poor removal of mortar smears.  <i>Rough Texture:</i> Mortar and dirt tend to penetrate deep into textures: additional area for water and acid absorption; essential to use pressurized water during rinsing.
Red Body with Sand Finish or Surface Coating	Bucket and Brush Hand Cleaning	Clean with plain water and scrub brush using light pressure. Excessive mortar stains may require use of cleaning solutions. <i>Sandblasting is not recommended.</i> Cleaning may affect appearance.
Light Colored Units: White, Tan, Buff, Gray, Specks, Pink, Brown and Black	Bucket and Brush Hand Cleaning  Pressurized Water  Sandblasting	<i>Do not use muriatic acid!!</i> Clean with plain water, detergents, emulsifying agents, or suitable proprietary compounds. Manganese colored brick units tend to react to muriatic acid solutions and stain. Light colored brick are more susceptible to "acid burn" and stains, compared to darker units.
Light Colored Units With Sand Finish or Surface Coating	Bucket and Brush Hand Cleaning	See notes for Red Body with Sand Finish or Surface Coating and Light Colored Units: etc. <i>Sandblasting is not recommended.</i>
Glazed Brick	Bucket and Brush Hand Cleaning Pressurized Water	Wipe glazed surface with soft cloth within a few minutes of laying units. Use of soft sponge or brush plus ample water supply for final washing. Use detergents where necessary and acid solutions only for <i>very difficult mortar stain</i> . Do not use acid on salt glazed or metallic glazed brick. Do not use abrasive powders. Do not use metal cleaning tools or brushes.
Colored Mortars	Method is generally controlled by the brick unit	Many manufacturers of colored mortars do not recommend chemical cleaning solutions. Most acids tend to bleach colored mortars. Mild detergent solutions are generally recommended.

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**Bucket and Brush Hand Cleaning**

This is probably the most popular but most misunderstood of all the methods used for cleaning brick masonry. Its popularity is due to the simplicity of execution and the ready availability of proprietary cleaning compounds. A recommended general procedure using proprietary compounds, detergents or acid solutions is as follows:

1. Select the proper solution.
  - a. For proprietary compounds, make sure that the one selected is suitable for the brick and follow the cleaning compound manufacturer's recommended dilution instructions. Many proprietary cleaning solutions perform in a satisfactory manner for their intended cleaning jobs. However, their formulae are not generally disclosed and may be subject to change. It is suggested, therefore, that each product being considered be *sample tested* on a panel or inconspicuous wall area and judged on a trial basis before being used.
  - b. Detergent or soap solutions may be used to remove mud, dirt and soil accumulated during construction. A suggested solution is 1/2-cup dry measure (0.14 L) of trisodium phosphate and 1/2 cup dry measure (0.14 L) of laundry detergent dissolved in one gallon (3.9 L) of clean water.
  - c. For acid solutions, mix a 10% solution of muriatic acid (9 parts clean water to 1 part acid) in a non-metallic container. Pour acid into water. Do not permit metal tools to contact the acid solution. There is the temptation to mix acid solutions stronger than recommended in order to clean stubborn stains. The indiscriminate use of any acid solution may tend to cause further stains.
2. Schedule cleaning at least seven days after the brick masonry is completed. Mortar must be thoroughly set and cured. Prolonged time periods between the completion of the masonry work and the actual cleaning should be avoided when possible. Mortar smears and splatters left over a long period of time (6 months to 1 year) can cure on the wall surface and become very difficult to remove.

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3. Remove larger mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.
4. Protect metal, glass, wood, limestone and cast stone surfaces. Mask or otherwise protect windows, doors, and ornamental trim from cleaning solutions.
5. Presoak or saturate the area to be cleaned. Flush with water, from the top down. Saturated brick masonry will not absorb the cleaning solution or dissolved mortar particles. Areas below should also be saturated in order to prevent absorption of the run-off from above.
6. Starting at the top, apply the cleaning solution. Use a long handled stiff fiber brush or other type as recommended by the cleaning solution manufacturer. Allow the solution to remain on the brickwork 5 to 10 minutes. For proprietary compounds follow the manufacturer's instructions for application and scrubbing. Wooden paddles or other non-metallic tools may be used to remove stubborn particles. Do not use metal scrapers or chisels. Metal marks will oxidize and cause staining.
7. Heat, direct sunlight, warm masonry and drying winds will affect the drying time and reaction rate of cleaning solutions. Ideally, the cleaning crew should be working on shaded areas to avoid rapid evaporation.
8. Rinse thoroughly!! Flush walls with large amounts of clean water from top to bottom before they can dry. Failure to completely flush the wall of cleaning solution and dissolve matter from top to bottom may result in the formation of "white scum".
9. Work on a small area. The size of the "wash down" area should be determined after a trial run. This will permit the cleaning crew to examine work for initial results.

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**Pressurized Water Cleaning**

To cut labor costs, many cleaning contractors utilize pressurized water. Some pressure systems feature a pressure gun and nozzle equipped with a control switch. This setup permits the operator to apply solutions to a wall over 100 ft. (30.5 m) from the base unit. Other systems have two separate hoses - one with plain water and the other with a cleaning solution. Low pressure has been defined as 100 to 300 psi (700 to 2100 kPa), medium pressure as 300 to 700 psi (2100 to 4850 kPa) and high pressure as 700 psi (4850 kPa) or greater. A sand finish or a surface coating may be removed by pressurized water cleaning, resulting in a different appearance. Nozzle pressure in excess of 700 psi (4850 kPa) may damage brick units and erode mortar joints.

Equipment should be as portable as possible. Units may be on wheels, skids, trailers, or pick-up truck beds. More elaborate systems include pumps, engines, acid containers, and water storage tanks fixed on truck beds.

Cleaning compounds used with this method should be compatible with the equipment. Some equipment manufacturers are careful to recommend that only specific cleaning compounds be pumped through their equipment. Others build pumps that will resist hydrochloric acid solutions for reasonable lengths of time.

The following procedure is suggested:

1. Select and test the cleaning solution on a sample area. Check the equipment for cleaning solution compatibility. For proprietary compounds, mix in accordance with the manufacturer's instructions.
2. - 5. Presoak wall. Same as steps 2 through 5 of *Bucket and Brush Hand Cleaning* method.
6. Application of cleaning solutions may be by a low-pressure sprayer, 30 to 50 psi (200 to 350 kPa), or through the high-pressure cleaning unit.
7. Permit the cleaning solution to remain on the wall for approximately 5 minutes.
8. Starting at the top, flush the wall down, as in the previous procedure.

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*Caution: It is possible for solutions to be driven into the masonry when applied under high pressure, and become the source of future staining. However, if the walls are sufficiently saturated with water before the solutions are applied, the risk of penetration is reduced. Experience has shown that this cleaning method has a high probability of changing the appearance of sand molded brick, sand-faced extruded brick, and brick with glazed coatings or slurries applied to the finished faces. The brick manufacturer should be consulted on the use of high-pressure water cleaning of such brick.*

**Sandblasting**

Dry sandblasting has been around for many years and is one method that may be used to clean brick masonry. However, there is also the possibility that, through improper execution, the face of brick units and mortar joints may be scarred. This method is sometimes preferred over conventional wet cleaning since it eliminates the problem of chemical reaction with vanadium salts and other materials used in manufacturing brick. Light and heavily sanded, coated, glazed and slurry finished brick should *not* be cleaned by sandblasting.

Sandblasting by a qualified operator, in conjunction with proper specifications and job inspection, can be satisfactory. Basically, it involves a portable air compressor, blasting tank, blasting hose, nozzle, and protective clothing and hood for the operator. The air compressor should be capable of producing 60 to 100 psi (400 to 700 kPa) at a minimum airflow capacity of 125 cu ft. (3.5 m<sup>3</sup>) per minute. The inside orifice or bore of the nozzle may vary from 3/16 to 5/16 in. (4.8 to 7.9 mm) in diameter. The sandblast machine (tank) should be equipped with controls to regulate the flow of abrasive materials to the nozzle at a minimum rate of 300 lb/h (0.004 kg/s).

There are various degrees of cutting or cleaning desired and consequently many types of abrasive materials. They may be of mined silica sand, crushed quartz, granite, white urn sand (round particles), crushed nut shells, and other softer abrasives. Mined silica sands and crushed quartz should have a hardness of approximately 6 on Moh's Scale and be a Type "A" or "B" gradation. See Table 2.

A suggested procedure for sandblasting is as follows:

1. Select sandblast materials that are clean, dust free and abrasive.
2. Brick masonry should be dry and well cured.
3. Remove all large mortar particles, as in previous methods.

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4. Protect non-masonry surfaces adjacent to cleaning areas. Use plastic sheeting, duct tape or other covering materials.
  
5. Test clean several areas at varying distances from the wall and several angles that afford the best cleaning job without damaging brick and mortar joints. Workmen should be instructed to direct abrasive at the units and not on the mortar joints.

**TABLE 2**  
**Typical Screen Analysis for Sandblasting Sand Abrasives<sup>a</sup>**

Type Gradation	U.S. Sieve Size	Percent Passing
Type "A"	30 Mesh	98-100
Fine Texturing <sup>b</sup>	40 Mesh	75-85
	50 Mesh	44-55
	100 Mesh	0-15
	200 Mesh	0
Type "B"	16 Mesh	87-100
Medium Texturing <sup>c</sup>	18 Mesh	75-95
	30 Mesh	20-50
Texturing <sup>c</sup>	40 Mesh	0-15
	50 Mesh	0-15

<sup>a</sup>The screen analysis listed above is suggested primarily for mined silica sands and crushed quartz. Reference source: "Good Practice for Cleaning New Brickwork", produced by the Brick Association of North Carolina, 822 N. Elm St., Greensboro, NC 27415.

<sup>b</sup>Type "A" gradation is suggested for very lightly soiled brick masonry or where very light, fine texturing of the masonry surface is permitted.

<sup>c</sup>Type "B" gradation is suggested for heavy mortar stains, or where a medium texturing of the masonry surface is permitted.

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**REMOVAL OF EXTERNALLY CAUSED STAINS**

**General**

These are stains caused by external materials being spilled, splattered on, and absorbed by the brick. Each is an individual case and must be treated accordingly.

A large number of external stains can be removed by scrubbing with kitchen cleanser. Others can frequently be removed by bleaching with household bleach. A combination, such as is found in some kitchen cleansers, may prove most effective. Table 3 lists sources of some materials suggested for this use.

A Warning: Some chemicals and resulting fumes may be harmful. Protective clothing and accessories, proper ventilation and safe handling procedures must be exercised. The use and disposal of some chemicals are regulated by federal, state or local laws and should be researched before use.

**Paint Stains**

For fresh paint, apply a commercial paint remover, or a solution of trisodium phosphate in water at the rate of 2 lb. (0.91 kg) of trisodium phosphate in 1 gal (3.79 L) of water. Allow to remain and soften the paint. Remove with a scraper and a stiff bristle brush. Wash with clear water. There are also commercial paint removers in the form of a gel solvent. These should be applied on a small test area on a trial basis. For very old dried paint, organic solvents similar to the above may not be effective, in which case the paint must be removed by sandblasting or scrubbing with steel wool.

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**CLEANERS & SIDING MAINTENANCE (continued)**

**Stains of Unknown Origin**

Stains of unknown origin can be a real challenge. Laboratory tests of unknown stains maybe necessary to determine their composition. Then the appropriate method may be implemented to clean the brickwork. The indiscriminate use of any cleaning agent may aggravate the initial stain and cause further staining. The application of a cleaning agent without identifying the initial stain may result in other stains, which are difficult to remove. However, appearance of the stain may be the first clue.

Rust-colored stains may actually be rust. Such stains are quite common and have been known to come from mortar ingredients, wall ties or joint reinforcement with inadequate cover, welding splatter on the brick, or something placed on the pile of brick prior to being laid in the wall.

"Green stains" may be grass, moss or vanadium efflorescence. "Brown stains" may also be vanadium efflorescence, or possibly manganese staining.

One test useful in narrowing down the list of possible causes of a stain involves a substance ordinarily not placed on brick masonry. Concentrated sulfuric acid in contact with an organic material, will turn it black. This is a quick and easy way to identify stains originating from such a material. Organic stains can usually be removed with household bleach or oxalic acid.

**CLEANING EXISTING MASONRY**

The paper, "Cleaning Masonry - A Review of the Literature", by Clayford T. Grimm, lists various methods of cleaning exterior masonry walls. They are: high-pressure steam, sandblasting, hand washing, pressurized water and chemicals with steam.

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**CLEANERS & SIDING MAINTENANCE (continued)**

**High-Pressure Steam**

This method lends itself readily and satisfactorily to various types of masonry and is generally not injurious to most masonry surfaces. Buildings with smooth hard brick or brick with glazed surfaces should always be cleaned with steam. The more impervious a brick unit, the easier it should clean. Steam cleaning without chemical additives are usually at pressures less than 60 psi (400 kPa).

In most cases, buildings may be cleaned satisfactorily with plain high-pressure steam. For stains it is sometimes necessary to use a chemical or detergent solution.

**Sandblasting**

The dry method of sandblasting should be employed only when brick will not be damaged and when certain types of brick cannot be successfully cleaned with high-pressure steam. See the section on *Sandblasting* under *Cleaning New Masonry*.

**Wet Sand Cleaning**

The wet sand cleaning method is used on hard brick and depends on a water-cushioned abrasive action for its effectiveness. It is suggested for removal of paint or other surface coatings, where abrasion of the surface is permissible. Wet sand cleaning employs water in the cleaning action to eliminate dust.

**Wet Aggregate Cleaning**

The wet aggregate cleaning method is a special process for use on soft brick and soft stone materials, and is particularly effective on surfaces with flutings, carvings and other ornamentation. It is a gentle but thorough process, employing a mixture of water and a friable aggregate free from silica, delivered at low pressure through a special nozzle with a "scouring" action, which cleans effectively without damage to the surface.

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**CLEANERS & SIDING MAINTENANCE (continued)**

**Hand Washing**

Many buildings of smaller size have been cleaned successfully by hand washing. It is a bit slower method and does not give the added advantage of heat as in high-pressure steam. Usually using soap or detergent with cold water does this work. The method is generally more costly because it is slower, does not lend itself to a job of any size, and may need to be repeated more often. See the section on *Bucket and Brush Hand Cleaning*.

**High-Pressure Cold Water**

This method usually results in a satisfactory job. An ample water supply is necessary. However, disposing of large volumes of water used is sometimes a problem.

On hard burned brickwork, water at very high pressure can be effective but requires careful application by experienced operators. Pressure should not exceed that which would damage the brickwork being cleaned. Nozzle pressure in excess of 700 psi (4850 kPa) can damage brick and mortar joints.

**Chemicals and Steam**

Mr. Grimm points out that chemicals and high-pressure steam are used primarily to remove applied coatings to masonry, such as paint. This is a highly specialized field and frequently the proper cleaning agent can be determined only after an analysis of the various factors involved in a particular project.

**CLEANING HISTORIC STRUCTURES**

This type of cleaning endeavor should be referred to a restoration specialist. There are comprehensive papers and publications available on the subject of restoration. Before an old structure is to be cleaned, several questions should be asked before making a final decision, such as: (1) Why clean?, (2) What is the dirt? and (3) What is the construction of the building?

The query "Why Clean?" is posed in the publication "The Cleaning and Waterproof Coating of Masonry Buildings" - *Preservation Briefs No. 1*, by Robert C. Mack, AIA.

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**CLEANERS & SIDING MAINTENANCE (continued)**

**SUMMARY**

Cleaning brick masonry still remains, for the most part, a trial-and-error procedure. Therefore, it is strongly suggested that any cleaning procedure and chemical cleaning solution be tested as suggested in this *Technical Notes*. Such testing should be performed under conditions of temperature and humidity that will closely approximate those conditions under which the brick masonry will be cleaned. Cleaning compounds recommended by the brick or cleaning agent manufacturer should also be trial tested before being committed to the entire project.

If general suggestions and recommendations contained in this *Technical Notes* are followed with good judgment and common sense, successful cleaning of brick masonry should be possible and practical. Due to the diverse nature of cleaning solutions, procedures and problems, the Brick Institute of America cannot accept responsibility for the final success or effectiveness of these procedures.

In conclusion, nothing is quite as effective as careful attention exercised during construction to keep brick walls relatively clean. If this is successful, it will eliminate the need for costly cleaning procedures.

**REFERENCES**

More detailed information on subjects discussed here can be found in the following publications:

1. Grimm, C.T., "Cleaning Masonry - A Review of the Literature", Construction Research Center, University of Texas at Arlington, 1988.
2. Mack, R.C., "The Cleaning and Waterproof Coatings of Masonry Buildings", *Preservation Briefs No. 1*, National Park Service, Washington, D.C., 1975.