U.S. General Services Administration

Removing Vanadium Stains from Brick Masonry

Procedure code:
421112S
Source:
NPS Southeast Regional Office
Division:
Masonry
Section:
Brick Unit Masonry
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REMOVING VANADIUM STAINS FROM BRICK MASONRY

THE CLEANING OR REMOVAL OF STAINS FROM MASONRY MAY INVOLVE THE USE OF LIQUIDS, DETERGENTS OR SOLVENTS WHICH MAY RUN OFF ON ADJACENT MATERIAL, DISCOLOR THE MASONRY OR DRIVE THE STAINS DEEPER INTO POROUS MASONRY. USE THE PRODUCTS AND TECHNIQUES DESCRIBED HERE ONLY FOR THE COMBINATIONS OF DIRT/STAIN AND MASONRY SPECIFIED.

PART 1---GENERAL

1.01 SUMMARY

A. This procedure includes guidance on removing yellow or green stains from brick masonry resulting from deposits of vanadium salts on the masonry surface.

B. Vanadium staining is a form of efflorescence that originates in the raw material used to manufacture certain brick units. It develops when moisture in the wall draws salts and color from the brick composition to the surface of the masonry. As the water evaporates, vanadium staining is left behind.

C. Vanadium stains are yellow, green, brownish-green or brown and are frequently mistaken for organic growth. They typically occur on red, buff or white brick. They often result from impurities within the masonry or from metal anchoring or support systems which contain vanadium alloys. Vanadium stains also develop as a result of washing with hydrochloric acid.

D. Safety Precautions:

1. DO NOT save unused portions of stain-removal materials.

2. DO NOT store any chemicals in unmarked containers.

3. EXCELLENT VENTILATION MUST BE PROVIDED WHEREVER ANY SOLVENT IS USED. USE RESPIRATORS WITH SOLVENT FILTERS.

4. No use of organic solvents indoors should be allowed without substantial air movement. Use only spark-proof fans near operations involving flammable liquids.

5. Provide adequate clothing and protective gear where the chemicals are indicated to be dangerous.

6. Have available antidote and accident treatment chemicals where noted.

E. See 01100-07-S for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Safety Precautions

2. Historic Structures Precautions

3. Submittals

4. Quality Assurance

5. Delivery, Storage and Handling

6. Project/Site Conditions

7. Sequencing and Scheduling

8. General Protection (Surface and Surrounding)

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Regional Historic Preservation Officer (RHPO).

PART 2---PRODUCTS

2.01 MANUFACTURERS

A. Diedrich Technologies, Inc.

2.02 MATERIALS

CAUTION: DO NOT USE ANY ACIDIC SOLUTIONS ON LIGHT-COLORED BRICK. THERE ARE SPECIAL PROPRIETARY CLEANING COMPOUNDS AVAILABLE FOR CLEANING LIGHT-COLORED BRICK. THEY SHOULD BE TESTED FOR EFFECTIVENESS PRIOR TO USE.

THE ADVICE OF THE BRICK MANUFACTURER SHOULD BE REQUESTED AND FOLLOWED.

NOTE: Chemical products are sometimes sold under a common name. This usually means that the substance is not as pure as the same chemical sold under its chemical name. The grade of purity of common name substances, however, is usually adequate for stain removal work, and these products should be purchased when available, as they tend to be less expensive. Common names are indicated below by an asterisk (*).

A. Potassium Hydroxide (KOH):

1. A white deliquescent solid that dissolves in water with much heat to form a strongly alkaline and caustic liquid and is used chiefly in making soap and as a reagent.

2. Other chemical or common names include Caustic potash*; Caustic potassa*; Hydrate of potassa*.

3. Potential Hazards: TOXIC AND CORROSIVE TO FLESH.

4. Available from chemical supply house, drugstore or pharmaceutical supply distributor, hardware store, or garden and lawn supply center.

-OR-

Sodium Hydroxide (NaOH):

1. A white brittle solid that is a strong caustic base used especially in making soap, rayon, and paper.

2. Other chemical or common names include Caustic soda*; Hydrate of soda*; Hydrated oxide of sodium*; Lye*; Mineral alkali*; Soda lye*; Sodic hydrate*; Sodium hydrate*.

3. Potential Hazards: CORROSIVE TO FLESH AND FLAMMABLE (WHEN IN CONTACT WITH ORGANIC SOLVENTS).

4. Available from chemical supply house, drugstore or pharmaceutical supply distributor, hardware store, or paint store.

-OR-

Proprietary Cleaner:

1. For normal-colored brick, try "Diedrich 202V Vana-Stop" (Diedrich Technologies), or approved equal.

2. For light-colored brick, try "EcoScrub Acid Free Masonry Cleaner" (Diedrich Technologies), or approved equal.

B. Clean, potable water

C. Clean natural fiber rags

2.03 EQUIPMENT

A. Garden hose and nozzle

B. Stiff bristle brushes (non-metallic)

C. Wood scrapers

PART 3---EXECUTION

3.01 PREPARATION

A. Protection: Provide adequate wash solutions (i.e. water, soap and towels) before starting the job.

3.02 ERECTION/INSTALLATION/APPLICATION

NOTE: DO NOT TRY MORE THAN ONE TREATMENT ON A GIVEN AREA UNLESS THE CHEMICALS USED FROM PRIOR TREATMENT HAVE BEEN WASHED AWAY.

A. Mix 1/2 lb (0.23 kg) potassium or sodium hydroxide with 1 qt. (0.95 L) water -OR- 2 lbs (0.91 kg) potassium or sodium hydroxide with 1 gal (3.79 L) water

B. Thoroughly wet the masonry surface with clean, clear water.

C. Brush or spray apply the potassium or sodium hydroxide solution (see 3.02 A. above) to the masonry surface.

D. Allow to remain on the surface for 2 or 3 days.

E. Thoroughly rinse the surface with clean, clear water to remove any white salt accumulations resulting from the hydroxide, and allow to dry.

-OR-

F. Use a proprietary cleaner to remove the staining. Follow manufacturer's instructions for application and precautions.

NOTE: PROPRIETARY CLEANERS MUST BE TESTED PRIOR TO USE FOR STAIN REMOVAL.

3.03 ADJUSTING/CLEANING

A. Upon completion of the masonry cleaning work, clean window glass and spattered adjacent surfaces.

Last Reviewed: 2018-10-25