

## PHB Tech Bullet #2

# Clay Paver Maintenance

## Basic Maintenance

**Clay pavers require no special maintenance as natural weathering keeps most clay paving systems clean and beautiful.** Pressure washers are not recommended for use on flexible base applications. The pressure washer tends to remove joint sand which compromises interlock. We suggest using a stiff application brush and a normal pressured garden hose.

For specific cleaning situations like oil stains or spills, use commercial cleaners generally available at masonry supply outlets. When using any type of cleaner, always test on a small hidden portion of the pavement. Prewet pavement thoroughly before cleaning and rinse after with clean water. In mortared applications, use Sure Klean 600 or 202 New Masonry Detergent, or equivalent as directed. Vanatrol or 202V Vana-Stop or an equivalent product should be used to clean all light colored and brown pavers. **DO NOT USE MURIATIC ACID.** Pressure washers can be used provided application pressure is limited to 30-50 psi and a 50-degree Fan Tip is used. Rinse pressure should not exceed 200-300 psi.

## Sealers

**Paver color is permanent. Sealers are not necessary for long-term durability or color retention.** A large sealer manufacturer has done a disservice to clay pavers by suggesting that clay pavers will last longer if sealed with their silicone sealer. In fact, silicone sealers do not "breathe" and may contribute to spalling.

If a sealer is used, it should be a breathable sealer like siloxane.

There are certain applications where sealers may be applied. For example, the largest theme park operator in the US uses a sealer to prevent sand loss during daily cleaning operations and to cut down stains left by chocolate ice cream and other food products. In vehicular applications, joint sand stabilizers are used to prevent sand loss (preserving interlock) that is common from street cleaning and tire suction (Surebond 1370 or Sandlock).

## Moss & Weeds

The existence of moss is an indication of poor drainage (in a shaded area) as the saturation of water creates an ideal environment for growth. The best solution is to keep the area dry by improving drainage or elevation although these remedies may not be practical. For moss and organic growth removal, a three-to-one solution of water and chlorine bleach is recommended or a one to one dilution in severe cases.

Weed growth in flexible base paving systems is common in lower traffic areas. Contrary to popular belief, growth takes place in the sand joint and not from underneath the pavers. Weed killer such as Round Up will handle existing growth while a pre-emergent weed killer can be used in the spring as a prevention measure. Joint sand stabilizers are also effective at weed prevention (Surebond1370 or Sandlock).

## Snow Removal & De-Icing

Snow and ice can be removed with normal hand equipment or motorized vehicles. Snow plow blades should be equipped with a rubber edge and set @ 1/4" above the pavement.

Rotary brushes and snow blowers can also be used.

**The use of rock salts are not recommended for snow and ice removal because of the possibility of efflorescence.** Non-sodium de-icers that are environmentally compatible are available as well as sand or cinders for traction control. An effective non-sodium deicer tested by PHB for efflorescence, is IceBan. For information contact [www.iceban.com](http://www.iceban.com) or 888-iceban-1.

## Efflorescence

Efflorescence is a crystalline salt deposit on the surface and in the pores of concrete, masonry, and other building products. A phenomenon reported as early as the 1870's and much studied since, it can appear as sulphate and carbonate compounds of sodium, potassium, calcium, magnesium and aluminum. Chlorides may also occur as efflorescence.

There are several sources for efflorescence: 1) the movement of groundwater that moves upwards, by capillary action or "wicking", into masonry or concrete materials. 2) salts in the soil that are in contact with paving can migrate above grade. 3) natural-state salts that are found in mortar, concrete or other building products. 4) contamination of masonry components (including sand) by seawater. 5) the improper use of hydrochloric acids in cleaning solutions. 6) the use of calcium chloride as a mortar accelerator. 7) the use of lime base aggregates as a base material or as bedding sand in the form of screenings. 8) salts used for de-icing purposes in the winter months, the most common outside source of efflorescence in paving applications.

Although rare, some raw material used to make clay brick contain small amounts of salt. However, these small amounts are minor compared to studies that found two to seven times as much soluble material in concrete products versus fired clay material. W.E. Brownell concluded in his research study that the most common form of efflorescence comes from the "migration of 'free-alkali' solutions from cementitious products. This would include any newly poured concrete curb, foundation or sub base slab.

Efflorescing salts dissolve in water and are absorbed into the masonry pores. Typically, clay bricks can absorb 5% to 8% of their weight in water. Heat from the sun (or other source) begins to draw the moisture to the surface and as the water completely evaporates, the salt deposits are left on the surface.

Since humidity and moisture play a key role in the efflorescence process, some areas of the country will be affected more than others. Seasons will play a role as precipitation during season changes will increase the likelihood of efflorescence.

The most important solution to solving efflorescence is the avoidance of efflorescing materials in the paving system. The second best solution is finding, locating and dealing with the source of water. Since the source of water in a paving application is generally clear, the most important factor in limiting the occurrence of efflorescence is insuring adequate drainage of the pavement through

grading or specific drainage systems. Good drainage will keep the pavers dryer and thus, they will be less likely to effloresce.

While efflorescence control systems are available, they don't guarantee full arrest of the problem and tend to be expensive. The best thing to do is to allow the efflorescence to run its course provided that the paved area has good drainage. The main reasons for this recommendation are as follows: the source of the salt is most likely coming from base materials, mortar or de-icing salt residue. In a flexible base application, after 6 months, 90 % of the water will run off the paving surface and away from the pavers versus down through the joints. This change should help carry the salts in solution away from the pavement. In all cases, free salts dissipate eventually and the problem goes away for good, generally within 18 months.

As a general rule, the removal of efflorescing salts from the face of masonry is a relatively easy operation. Efflorescing salts can be removed with dry brushing or with clear water and a stiff brush. The crystals are superficial and do not affect the durability of the pavers.

For further reference, see BIA Technical Notes- 23, 23A, 20.



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