



A significant factor in the durability of any brick is its ability to give up moisture through evaporation. This prevents it remaining saturated for long periods during cyclic frost conditions. Sealing the surface of a brick with a non-porous compound therefore, impairs its ability to perform this function and can lead to spalling of the brick face through frost attack; an effect which would not arise in an untreated area. This risk may be counter-balanced somewhat by the beneficial water-repellent properties of the coating.

PAVING

One of the major benefits of clay pavers is that they require little or no maintenance. Consequently there are no set procedures to follow with regard to their upkeep. Normal wear and tear will, however, lead to a gradual build-up of detritus, which can be removed by regular brushing.

If the paving is situated in a damp shaded location, a certain amount of moss or algae growth may occur resulting in a slippery surface. This should be treated with a proprietary weed killer used strictly in accordance with the manufacturers instructions.

Cleaning with a power hose will effectively remove accumulated grime and restore the natural colour of the paving. With flexible paving, re-sanding of joints will be necessary following cleaning but care should be taken to avoid disturbance of the bedding sand.

This is all that is required to maintain brick paved areas, although the frequency of the treatment will obviously depend on the amount of traffic and the location of the paving concerned.

In winter conditions the application of a de-icing agent to clay pavers will be necessary to ensure that their skid-resistance properties are maintained. Whilst gritting will prevent the formation of ice on paver surfaces, it is generally advisable to use de-icing agents which do not contain salts, as these may lead to the discolouration or staining of the paver surface which, although harmless, will appear unsightly.

Cleaning and Maintenance of Brickwork and Pavers



INTRODUCTION

Bricks and clay pavers are manufactured from naturally occurring substances, with their own particular chemistry. It follows that the behaviour of clay fired products in use will, inevitably, reflect their origins, certain phenomena in the appearance of brickwork being attributable entirely to the mineral composition of the bricks in question and their interaction with the elements.

Occasionally this can result in certain reactions which may temporarily impair the appearance of new brickwork. Such transient blemishes usually disappear of their own accord, given time and weathering, but where circumstances do not favour nature taking its course, other methods may be employed which have a more immediate effect. These proven techniques enable cleaning to be accomplished more quickly, and without detriment to the brickwork involved.*

*IMPORTANT - prior to carrying out any cleaning process, it is strongly recommended that a small sample area first be treated to assess the suitability of the technique).



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BRICKWORK

Bricks require no special maintenance. They may be left to weather naturally and mellow progressively, a characteristic of bricks in general.

GENERAL CLEANING FOLLOWING CONSTRUCTION

Gentle scraping and careful dry or wet brushing with a detergent solution (rinsed with clean water) is often all that is required to remove most of the staining typically associated with other building operations. However, where stains are not water soluble, as with bitumen, oil or cement-based material for example, a suitable chemical solvent is essential.

Many suitable proprietary brands of cleaner are generally available at Builders' Merchants. These are based for the most part on hydrochloric acid (HCl) and on other chemicals too numerous to mention. Whichever type is obtained, the manufacturer's recommendations for use must be followed.

Alternatively, a straightforward dilute solution of hydrochloric acid would be adequate. The solution should be just strong enough to bring about the chemical reaction, which is typified as an effervescence on the surface of the brickwork. Solutions stronger than one part HCl (36% w/w) to nine parts water should be applied with exceptional care, in very limited amounts, over a short duration. For stubborn stains, repeated applications may be necessary. Gentle but firm brushing with a stiff non-metallic bristled brush will greatly facilitate removal.

In order to ensure that only its surface is cleaned, the brickwork should be made sufficiently wet as to reduce its suction rate. This should inhibit absorption of any significant amount of solvent into the bricks, or more importantly, the mortar joints, which are generally more vulnerable to chemical attack.

The safety and protection of those carrying out such operations is of prime importance, as is the protection of adjoining materials such as metal windows, stone or concrete constructional elements, etc, which may be vulnerable to corrosion by the acid or to water staining. COSHH information on cleaning chemicals and appropriate personal protective equipment should be sought from chemical suppliers.

In an internal situation, apart from the additional problems of water disposal, attention should be paid to the proper provision of ventilation, to avoid any dangerous build-up of chemical fumes.

MOSS AND ALGAE GROWTH

This may appear on brickwork as a green stain and should not be confused with vanadium staining which can be similar in appearance.

Vanadium salts are only present in buff burning fire-clays, whilst algae can occur on any brick type. Being organic, algae requires certain conditions to survive. Given a suitable environment, it will feed on the trace mineral salts present in bricks, blocks, concrete or wood, etc.

Algae thrives in damp shady areas and is most commonly seen on sheltered elevations, particularly where vegetation or water are in fairly close proximity. Such growths do not survive in direct sunlight or dry conditions. They tend therefore to be more of a problem in the winter and early spring, usually dying off in the summer months.

Under certain conditions, algae may be present on unused bricks in their packs, encouraged by their prolonged storage with polythene wrapping and by moist conditions. Such growth is usually confined to the bottom outer layers and should not constitute grounds for rejection as it will quickly fade when the brick is built into work and exposed to direct sunlight.

Where dampness is caused by broken or badly fitted down-pipes, the problem of algal growth is fairly easy to resolve. Where climatic or topographical features are the cause however, a fungicidal wall wash will kill it off; although this treatment will need to be repeated as and when the growth reappears. Treating the wall when the bricks are dry and allowing the fungicide to be absorbed, will prolong the residual action. A dilute solution of household bleach has also proved a cheap and effective fungicide.

Washing down with a high pressure water jet is not generally recommended. If in doubt, contact the brick manufacturer.

EFFLORESCENCE STAINS

The formation of a white salty deposit on the face of brickwork is called efflorescence. It occurs on bricks which have become saturated prior to, or during, the building process.

All bricks contain soluble salts to some degree. It is therefore theoretically possible to induce efflorescence in any clay brick. In practice, some bricks are more likely to effloresce than others - this action will be dictated by the extent of salts present and the degree of saturation to which they are subject. Soluble salts are also contained in sand and cement and the deposit is often found to emanate, not from the brick, but from the mortar joint.

Efflorescence problems generally occur in the spring as a result of the drying out of brickwork built during the wet winter months. As the building dries, the water evaporates and the salts are left behind, forming the unsightly white deposit typical of this phenomenon.

Efflorescence rarely appears on structures built during the summer and much can be done to prevent its occurrence. The builder should, for instance, ensure his bricks are kept dry on site and cover his brickwork both overnight and during wet conditions.

Efflorescence is a temporary problem best overcome by the combined effect of time and weather. It will usually disappear within a few weeks, washed away by normal rainfall. With softer bricks, there is a certain amount of re-absorption which takes a little longer to clear.

Whilst natural weathering is preferable, efflorescence can be removed by brushing down with a stiff non-metallic brush, making sure that the deposit does not enter the brickwork at a lower level. Any remaining deposit can be removed or reduced using a minimum quantity of clean water.

VANADIUM STAINS

When fire-clay facing bricks are subjected to wetting, vanadium salts can leach out and cause a yellow/green stain on the face of the brick. This phenomenon appears only on cream or buff bodied fire-clay bricks. It is a form of efflorescence composed of water soluble salts of vanadium, naturally present in the fire-clay material from which this type of brick is manufactured. It should not be confused with the visually similar green algae growth sometimes seen on buff bodied bricks of any clay type when subjected to prolonged dampness in shaded locations.

Normal exposure to the elements is usually quite sufficient to allow the staining to weather off naturally, although the time it takes to do so will depend upon weather conditions, as the staining will only begin to disperse once the brickwork reaches a constant normal moisture content, and following exposure to sunlight and other external effects.

Vanadium staining can also be removed chemically, but specialist advice should be sought prior to any such action being taken. Hydrochloric acid-based masonry cleaning chemicals should not be applied to affected brickwork, since the substances have been known, on occasions, to fix the stains. In such circumstances specialist assistance will be required to overcome the problem.

Vanadium salts are undetectable during raw material preparation at the works. There is no opportunity, therefore, for extracting such substances at this stage of production. It must be stressed that these salts are common to all buff burning fire-clays and not confined to the bricks of any one manufacturer.

To minimise/alleviate the problem, it would be prudent to ensure, as far as is practically possible, that the bricks do not come into contact with excessive amounts of water during site storage. Protecting newly constructed brickwork from overnight rain as the work proceeds will also help.

This type of efflorescence is relatively rare and by no means a natural consequence of using cream or buff fire-clay bricks. When it does occur, it is normally a transient problem that does not detract from the long term appearance or durability of well designed and constructed brickwork.

LIME STAINS

Lime staining is caused when free lime leaches from mortar, or from concrete products, under excessively wet conditions and is evident as a white stain running down the masonry. Usually it occurs on newly built brickwork that has become saturated during construction. It can, however, occur on older masonry in some circumstances.

Unfortunately, unlike efflorescence, this staining will not weather off naturally and may require cleaning with a dilute hydrochloric acid solution. There are several proprietary brands of acid-based brick cleaner on the market which are suitable for this type of cleaning.

The protection of brickwork during construction will help to reduce the likelihood of lime staining.

IRON AND MANGANESE STAINS

These are quite rare and both appear as a brown or black stain, best left to weather away naturally. In severe cases, specialist advice should be sought as to their removal.

PAINT AND GRAFFITI

Water-soluble paint removers are available and should be used in accordance with the manufacturer's instructions. Some types of paint are very difficult to remove. Wherever possible, the paint manufacturer's advice should be sought. It may be necessary, particularly with a large area of brickwork, to employ the services of a specialist cleaning contractor.

WATERPROOFING TREATMENTS

The use of masonry paint systems, and other proprietary external finishes including colourless treatment, e.g. silicone-based water repellents, may increase the resistance of brickwork to rain penetration. However, surface treatments may also reduce the rate of evaporation of water from a wall and, depending upon exposure conditions, effectively increase the quantity of water retained. In extreme cases this may cause certain types of fired clay unit to suffer frost damage.

Surface treatments may also have a limited life, in addition to which their application could lead to an increased run-off of rainwater. This in turn may increase the wetting of any untreated masonry below, possibly giving rise to lichen growth and/or discolouration.

In conclusion, such treatments may not offer a genuine panacea for water penetration. As with all building materials, their limitations must be carefully weighed against their benefits, before they are specified.

ANTI-GRAFFITI TREATMENTS

There are many treatments of this type on the market. Unfortunately we are unable to recommend particular products, owing to the prolonged testing which verification of the various manufacturers' claims would require. Our main concerns however are (a) the appearance factor of the treated brickwork, and (b) the micro-porosity, and vapour resistivity, of the treated structure in allowing the brickwork to breathe.