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The Cleaning and Maintenance of Wall and Floor Tiles

Published by The Tile Association



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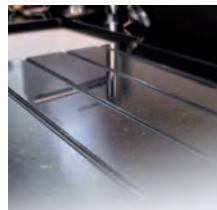
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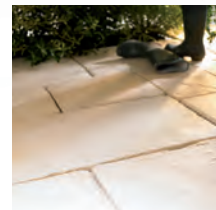
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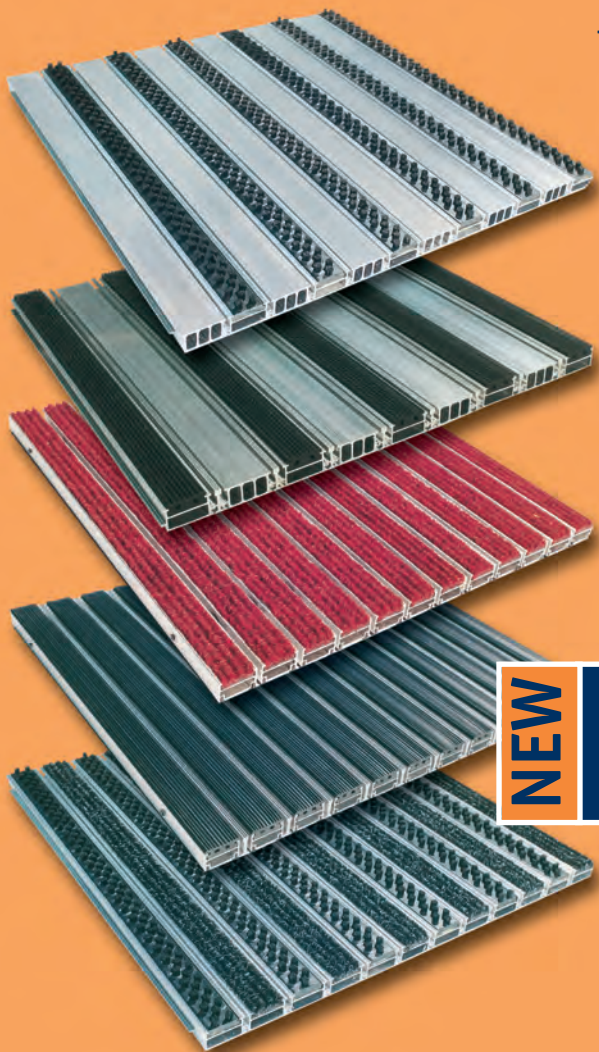
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1. Foreword

A Technical Working Group of The Tile Association has prepared the paper “The Cleaning and Maintenance of Wall and Floor Tiles”.

This paper has been written with the aim of providing advice and recommendations for all parties in the process of designing, fixing and using wall and floor tiles in domestic situation and commercial installations. The document should be read in conjunction with current and forthcoming British, European and International Standards.

The Tile Association acknowledges the support given by members of the Working Group, Health & Safety Executive and Ceram in the drafting of this document.

2. History and scope of document

It is now widely appreciated that in determining the total cost involved in providing any type of wall or floor finish, it is necessary to take into account not just the initial capital outlay but also the additional expense likely to be incurred in the subsequent cleaning maintenance and renewal of all such finishes.

One of the significant advantages that hard finishes such as ceramic and natural stone tiles have over other wall and floor finishes, besides durability is that they can be readily maintained in a clean, hygienic condition. Adherence to the cleaning procedures outlined in this document will enable you to take maximum advantage of these properties.

This document sets out to provide advice in ceramic, natural and agglomerate stone, metal and glass wall and floor tiles used externally and internally in consumer and commercial installations.

3. Considerations

To ensure that the installed wall and floor tiles provide a long lasting and functional finish it is important that an appropriate cleaning and maintenance programme is scheduled for the tiled installation. Care should be taken to ensure that the relevant cleaning and maintenance scheduled is fit for purpose and restores the surface finish of the tile back to its original installed state on a regular basis, the frequency of the cleaning programme will be dictated by the in service conditions and type of contamination.

Information regarding the cleaning and maintenance requirements of the tiles installed should be sought from the relevant tile supplier/manufacturer. Where possible the service conditions and type of contaminants that the surface will be subjected to should be established at the design stage and communicated to the tile supplier to ensure that the tile installed is both fit for purpose and able to be realistically cleaned and maintained.

With the variety of product types and surface finishes available on the market it is very important, particularly with natural stone materials, that the nature of the finish and how it performs in service is well understood by all parties involved in the ongoing cleaning and maintenance of the installation. Natural stone materials are quite varied in their composition, density and surface texture. Problems can occur when the particular stone product is wrongly categorised in accordance with BS EN 12440:2008 and treated in a way that does not suit its particular chemical

composition or surface finish. This can be avoided by securing expert advice from the relevant supplier.

Once the appropriate cleaning and maintenance programme has been established and the materials for the operation sourced it is imperative that the personnel involved in the day to day cleaning and periodic deep cleaning operations understand what is required to maintain the aesthetic and functional properties of the tiled finish. These should be checked on a regular basis to ensure that the correct procedure is being carried out and that the operation is having the desired effect. Any signs of deterioration in the surface appearance should be addressed and the cleaning and maintenance programme adjusted to restore inherent qualities of the tiled finish

4. Health and safety

Cleaning regimes should leave surfaces dry and must not have any detrimental effect on the tiling. A comprehensive cleaning regime will maintain the slip resistance characteristics of the tiles.

It is important that a risk assessment is undertaken before a cleaning and maintenance programme is undertaken.

All chemicals have their own hazards and it is important to understand that safety warnings issued by the manufacturers, of proprietary cleaning and chemical products should be read carefully and that they should be strictly adhered to.

These are examples of some of the symbols displayed on cleaning materials and their meaning:



Irritant



Flammable



Toxic



Harmful



Corrosive

Note: The Health and Safety Executive website has a useful guide to the definitions of hazard symbols and accompanying references. hse.gov.uk/chip/phrases.html

Manufacturers of cleaning and maintenance products produce Material Safety Data Sheets on their products and they should be read and understood before use. Chemicals should not be mixed.

Full personal protective equipment including the correct slip resistant footwear should be worn as directed by the appropriate product safety data sheets.

Cleaning equipment should be thoroughly cleaned and rinsed with clean water before being used again.

5. Cleaning and maintenance of ceramic tiles

It is important to introduce a frequent cleaning regime, rather than to allow a build up of dirt before cleaning a tiled surface.

Any loose dirt or grit should first be removed from the surface by vacuuming or sweeping with a dry brush followed by cleaning with warm water to which a neutral, low sulphate detergent has been added. This should be followed by a final rinsing with clean water to remove any residual dirt.

Examples of discoloured or stained tiles



Efflorescence



Red wine stains



Oxide stains

Routine Maintenance

The routine cleaning of glazed ceramic wall tiles should be carried out after the removal of any loose dirt or grit by wiping off with a dry cloth, followed by washing with warm water to which a pH neutral or suitable non-aggressive detergent has been added. Aggressive detergents should not be used.

Use the correct concentration of detergent and allow it time to work. The instructions on the container will offer advice on the length of time to allow. Rinse with clean water to ensure thorough removal of the detergent solution then the installation should be given a final wipe down and polish with a clean, dry, soft cloth.

ABRASIVE POWDERS WHICH MAY SCRATCH THE GLAZE MUST NOT BE USED.

These are examples of the surfaces of tiles:



Textured tile



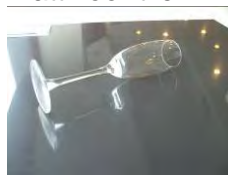
Matt floor tile



Stud tile



Riven tile



Polished porcelain



Glazed tile



Unglazed tile



Encaustic tile

In general ceramic wall and floor tiles are relatively low maintenance. The nature of the surface i.e. glazed or unglazed, smooth or profiled, can have a bearing on the method of cleaning and care should be taken to ensure that the cleaning and maintenance schedule applied restores the surface of the ceramic tile back to its original contamination free state after every cleaning operation.

5.1 Unglazed ceramic tiles

Unglazed ceramic tiles are predominantly used for flooring applications because of their durable and hard wearing characteristics. Tiles of this nature are manufactured in a wide variety of formats and surface finishes making them ideally suited to applications requiring the floor finish to have slip resistant properties.

In general, profiled surface tiles require a more demanding cleaning operation to ensure that the cleaning apparatus both loosens the dirt from around the profile and more importantly removes the contaminated dirty water from the surface.

5.1.1 Fully vitreous porcelain

Tiles in this category have water absorption of 0.5% or less.

5.1.2 Vitreous quarry and extruded quarry tiles

Tiles in this category generally have water absorption of 0.5% - 3%

5.1.3 Terracotta tiles

Terracotta (meaning baked earth) is clay based unglazed baked tile with a high absorbency level.

5.1.4 Geometric and encaustic tiles (e.g. Victorian)

Encaustic tiles literally means 'in burnt' and was used by the Victorians to describe unglazed floor tiles with inlaid different bodies at the surface. Encaustic tiles are inherently difficult to make and require a high degree of hand skilled craftsmanship; however the end result is a highly decorative and hard wearing floor tile. In the majority of instances encaustic tiles are combined with different shaped uni-coloured tiles called geometric tiles.

Both categories of tiles are relatively easy to clean and maintain as porcelain and vitreous floor tiles.

5.1.5 Polished tiles

A polished tile with a surface produced by machine grinding process to achieve a uniform mirror finish.

5.1.6 Semi Polished tiles

A tile with a surface produced by a machine grinding process to achieve a honed finish.

5.1.7 Partially polished tiles

A factory process which produces a honed or polished finish to the slightly raised areas of a tile which has an irregular surface.

5.2 Glazed ceramic tiles

5.2.1 Glazed ceramic floor tiles

Glazed ceramic floor tiles are readily cleaned and maintained. Any loose dirt should first be removed from the surface before cleaning the surface with warm water to which a neutral low sulphate detergent has been added. The surface should then be thoroughly rinsed with clean water.

Consideration may need to be given regarding cordoning off the floor while the surface is cleaned and restored to its dry clean state.

Caution - care should be taken to avoid the use of abrasive materials that may scratch the surface of the glaze.

5.2.2 Glazed ceramic wall tiles

Glazed ceramic wall tiles require little maintenance. The routine cleaning of glazed wall tiles should be carried out after the removal of any loose dirt or grit by wiping off with a dry cloth followed by washing with warm water to which a neutral, low sulphate detergent has been added. After a final rinsed with clean water to remove any residues of the detergent or cleaning solution the surface should be given a final wipe down and polished with a clean, dry, soft cloth.

Caution - care should be taken to avoid the use of abrasive materials that may scratch the surface of the glaze.

6. Cleaning and maintenance of natural stone

For effective cleaning and maintenance of any natural stone surface it is important to understand the nature and composition of the actual stone installed.

It is important to check whether the particular stone has been pre sealed at the quarry or requires pre-sealing before installation and grouting.

Natural stone types

Granite

In the natural stone trade 'granite' is used to describe a wide range of hard and durable rocks with a crystalline appearance made up of different coloured minerals. To the geologist, granites are coarse-grained, plutonic igneous rocks composed of feldspar, quartz and mica.

Basalt

A dark-coloured, fine grained basic igneous volcanic rock which has a dense fine grained texture.

Sandstone

Sandstone is an arenaceous sedimentary rock predominantly composed of grains of silica. Depending upon the particle size which can vary from 60 micron to 2mm, sandstones are characterised by their granular texture.

Quartzite

Quartzites are metamorphosed sandstones which have been subjected to extreme conditions of temperature and pressure. The end result is a dense and durable stone with a light colour and sugary appearance and texture.

Slate

Slate is a metamorphosed mudstone with a fine grained texture. Due to the alignment of the minerals that make up the rock, slate has a characteristic cleavage plane which enables the rock to be split into very thin sheets.

Limestone

Limestone is a sedimentary rock composed mainly of the mineral calcite (CaCO_3). Most limestones were deposited beneath the sea as a result of the accumulation of fossil shell debris or as a consequence of the precipitation of calcite in calcium rich waters. Limestones can vary tremendously in appearance, colour and texture and is one of the most abundant naturally occurring natural stones.

Travertine

Travertine is technically a limestone and is formed by the gradual deposition of calcium and magnesium salts, usually in hot springs or other situations where saturated solutions naturally occur. It is characterised by the presence of voids within the matrix which can vary hugely, both in the quantity in which they occur and in the form that they take.

Marble

Marble is a metamorphosed limestone and principally composed of recrystallised calcite. Pure marble is white but the presence of minerals other than calcite leads to the variation in colour and patterning.

There are misconceptions in terms of the definition of natural stones and it is important to understand the material that has been installed before commencing a cleaning and maintenance programme. It is equally important to recognise the inherent characteristics of the natural stone product in terms of the potential variations in the colouration, density and quality even from a stone procured in one batch from one area of the same quarry.

Before cleaning begins a small sample area of the natural stone should be tested, where using a spare piece of stone or using an inconspicuous area.

6.1 Limestone

6.1.1 Pre-clean

Pre-clean limestone with a specific pre-cleaning product if considered necessary. Dilute in accordance with the manufacturer's instructions. Wipe over stones with a cloth or sponge with the diluted product. If stubborn marks persist, use a white emulsifying pad to aid removal. Rinse and dry stones to avoid water marking. Note: the limestone must be completely dry before sealing.

6.1.2 Pre-seal

Use water or solvent based impregnators, for interior and exterior use. Note: follow instructions on curing and drying times before grouting commences.

6.1.3 Grout removal

Dilute an alkali product accordingly to the manufacturer's instructions. Wash over the stones with a white pad or sponge to remove residue. Rinse and towel dry stones.

Note: Increase drying times before final sealing, if a deeper clean was required for the removal of the contaminant.

6.1.4 Final seal and surface coatings

- Polished limestone - suitable impregnator (water and oil repellent) leaves a natural finish.
- Fine honed - suitable impregnator (water and oil repellent) leaves a natural finish
- Fine honed - suitable impregnator followed with a paste wax or specific solvent free emulsion. Leaves stone with sheen to gloss finish, interior only.
- Rough and sawn - suitable impregnator (water and oil repellent) leaves a natural finish
- Rough and sawn - suitable impregnator followed with a water based emulsion or similar to form a sheen to gloss finish, interior only.

Note: There are also products available to produce colour enhanced/wet look with matt to high gloss finishes. Contact your TTA specialist cleaning product member for advice and product information.

6.1.5 Daily and weekly maintenance

Use a pH neutral cleaner.

6.1.6 Deep cleaning and renovation

If an impregnator has been used on the floor area, the floor can be deep cleaned with an alkali product. This will de-grease the floor and grouting areas, in preparation for a new application of impregnator.

Dilute the product (see manufacturer's instructions)

Work in small controllable sections. Pour the diluted product onto a section, leave for 5-15 minutes depending on manufacturer's instructions, scrubbing with a specific brush or with large areas a rotary machine with a white pad. Every 2-3 minutes move the product around with the brush or pad to keep evenly distributed. Add more diluted product if the area starts to dry as this can cause staining within the stone.

Once all grease and grime is removed, rinse with fresh water several times, removing all product and water with a wet vacuum or mop. Towel dry the limestone, so no water marks remain.

If the floor to be renovated has had a build up of emulsions or waxes from repeated applications, a specific stripping agent (solvent or water based) should be used.

Work in small controllable sections. Pour the diluted or un-diluted product onto a section, leave for 5-15 minutes depending on manufacturer's instructions, scrubbing with a suitable brush or, on large areas, a rotary machine with a white pad every 2-3 minutes to keep product moving and working. Add more product if the area starts to dry as this can cause staining within the stone.

Once all waxes, grease and grime are removed, rinse with fresh water several times, removing all product and water with a wet vacuum or mop. Towel dry the limestone, so no water marks remain.

6.2 Granite

6.2.1 Pre-clean

Pre-clean polished and fine honed granite with a specific pre-cleaning product, if required. Dilute in accordance with the manufacturer's instructions.

Wipe over stones with a cloth or sponge. If stubborn marks persist, use a white emulsifying pad to aid removal. Rinse and dry stones to avoid water marking. Note: the granite must be completely dry before sealing.

Pre-cleaning honed and rough granite; if contamination is low, proceed as above. In more stubborn cases the stone may be cleaned with an acidic compound cleaner to remove quarry or manufacturing dusting. NB if these acidic products are to be used, it is advisable to test on an unused tile to check before application on installed tiling.

6.2.2 Pre-seal

Where necessary, use water or solvent based impregnators, for interior and exterior use.

Note: follow instructions on curing and drying times before grouting can commence.

6.2.3 Grout removal. Polished and fine honed

Dilute an alkali product to the right consistency. Wash over the stones with a white pad or sponge to remove residue. Rinse and towel dry stones.

Note: Increase drying times before final sealing, if a deeper clean was required for the removal of the contaminant. If the staining is still remaining, contact The Tile Association for advice and product information.

Removal of grouting from flamed, textured and rough granite; if contamination is low proceed as above, and in more stubborn cases the stone may be cleaned with an acidic compound cleaner to remove this contamination.

NB if these acidic products are to be used, it is advisable to test on an unused tile to check before application on installed tiling.

6.2.4 Final seal and surface coatings

- Polished granite - suitable impregnator (water and oil repellent) leaves a natural finish.
- Fine honed - suitable impregnator (water and oil repellent) leaves a natural finish
- Fine honed - suitable impregnator followed with a paste wax or specific solvent free emulsion. Leaves stone with sheen to gloss finish, interior only.
- Rough and sawn - suitable impregnator (water and oil repellent) leaves a natural finish
- Rough and sawn - suitable impregnator followed with a water based emulsion or similar to form a sheen to gloss finish, interior only.

Note: There are also products available to produce colour enhanced/wet look with matt to high gloss finishes. Contact your TTA member for advice and product information.

6.2.5 Daily and weekly maintenance

Use a specific pH neutral cleaner.

6.2.6 Deep cleaning and renovation

If an impregnator has been used on the floor area, the floor can be deep cleaned with an alkali product. This will de-grease the floor and grouting areas, in preparation of a new application of impregnator. Dilute the product (if required)

Work in small controllable sections. Pour the diluted product onto a section, leave for 5-15 minutes depending on manufacturers instructions, scrubbing with a specific brush or with large areas a rotary machine with a white pad every 2-3 minutes to keep product moving and working. Add more diluted product if the area starts to dry as this can cause staining within the stone.

Once all residues of grease and grime are removed, rinse with fresh water several times, removing all cleaning product and water with a wet vacuum or mop. Towel dry the granite, so no water marks remain.

If the floor to be renovated has had a build up of emulsions or waxes, a specific stripping agent (solvent or water based) should be used.

Work in small controllable sections. Pour the diluted or un-diluted product onto a section, leave for 5-15 minutes depending on manufacturer's instructions, scrubbing with a specific brush or with large areas a rotary machine with a white pad every 2-3 minutes to keep product moving and working. Add more product if the area starts to dry as this can cause staining within the stone.

Once all waxes, grease and grime are removed, rinse with fresh water several times, removing all product and water with a wet vacuum or mop. Towel dry the granite, so no water marks remain.

After restoration, if the surface appears worn, rather than regrinding the surface it may be possible to refresh the surface with proprietary emulsions or waxes, depending on the finish. Alternatively, it may be possible to use a polishing system, using powders, special emulsifying agents and non-rust steel wool pads. Worked with a rotary machine, this process can restore deep shine or lustre to the stone finish. Consult a specialist TTA member for more information.

6.3 Basalt

6.3.1 Pre clean

Pre-clean polished and fine honed basalt with a pre-cleaning product if required. Dilute in accordance with the manufacturer's instructions. Wipe over stones with a cloth or sponge. If stubborn marks persist, use a white emulsifying pad to aid removal. Rinse and dry stones to avoid water marking. Note: the basalt must be completely dry before sealing.

6.3.2 Pre-seal

Where necessary, use water or solvent based impregnators, for interior and exterior use.

Note: follow instructions on curing and drying times before grouting can commence.

6.3.3 Grout removal. Polished and fine honed

Dilute an alkali product to the right consistency. Wash over the stones with a white pad or sponge to remove residue. Rinse and towel dry stones.

Note: Increase drying times before final sealing, if a deeper clean was required for the removal of the contaminant. If the staining still remains, contact a TTA member for advice and product information.

Removal of grouting from flamed and rough basalt; if contamination is low (refer to the above)

In more stubborn cases, some basalts may be cleaned over with a very diluted specific combination acid to remove this contamination.

NB if these acidic products are to be used, it is advisable to test on an unused tile to check before application on installed tiling.

Note: some stones may appear lighter

6.3.4 Final seal and surface coatings

- Polished basalt - suitable impregnator (water and oil repellent) leaves a natural finish.
- Fine honed - suitable impregnator (water and oil repellent) leaves a natural finish
- Fine honed - suitable impregnator followed with a paste wax/ or specific solvent free emulsion. Leaves stone with sheen to gloss finish, interior only.
- Rough and sawn - suitable impregnator (water and oil repellent) leaves a natural finish
- Rough and sawn - suitable impregnator followed with a water based emulsion or similar to form a sheen to gloss finish, interior only.

Note: There are also products available to produce colour enhanced/wet look with matt to high gloss finishes. Contact your TTA member for advice and product information.

6.3.5 Daily and weekly maintenance

Use a pH neutral cleaner.

6.3.6 Deep cleaning and renovation

If an impregnator has been used on the floor area, the floor can be deep cleaned with an alkali product. This will de-grease the floor and grouting areas, in preparation of a new application of impregnator. Dilute the product (if required)

Work in small controllable sections. Pour the diluted product onto a section, leave for 5-15 minutes depending on manufacturer's instructions, scrubbing with a specific brush or with large areas a rotary machine with a white pad every 2-3 minutes to keep product moving and working. Add more diluted product if the area starts to dry as this can cause staining within the stone.

Once all residues of grease and grime are removed, rinse with fresh water several times, removing all products and water with a wet vacuum or mop. Towel dry the granite, so no water marks remain.

If the floor to be renovated has had a build up of emulsions or waxes, a specific stripping agent (solvent or water based) should be used.

Work in small controllable sections. Pour the diluted or un-diluted product onto a section, leave for 5-15 minutes depending on manufacturers instructions, scrubbing with a specific brush or with large areas a rotary machine with a white pad every 2-3 minutes to keep product moving and working. Add more product if the area starts to dry as this can cause staining within the stone.

Once all residues of waxes, grease and grime are removed, rinse with fresh water several times, removing all product and water with an wet vacuum or mop. Towel dry the basalt, so no water marks remain.

6.4 Marble

6.4.1 Pre-clean

Pre-clean marble with a specific pre-cleaning product if required. Dilute in accordance with the manufacturers instructions.

Wipe over stones with a cloth or sponge. If stubborn marks persist, use a white emulsifying pad to aid removal. Rinse and dry stones to avoid water marking.

Note: the marble must be completely dry before sealing.

6.4.2 Pre-seal

Where necessary, use water or solvent based impregnators, for interior and exterior use.

Note: follow instructions on curing and drying times before grouting can commence.

6.4.3 Grout removal

Dilute an alkali product to the right consistency. Wash over the stones with a white pad or sponge to remove residue. Rinse and towel dry stones.

Note: Increase drying times before final sealing, if a deeper clean was required for the removal of the contaminant.

6.4.4 Final seal and surface coatings

- Polished marble - suitable impregnator (water and oil repellent) leaves a natural finish.
- Fine honed - suitable impregnator (water and oil repellent) leaves a natural finish
- Fine honed - suitable impregnator followed with a paste wax/ or specific solvent free emulsion. Leaves stone with sheen to gloss finish, interior only.
- Rough and sawn - suitable impregnator (water and oil repellent) leaves a natural finish
- Rough and sawn - suitable impregnator followed with a water based emulsion or similar to form a sheen to gloss finish, interior only.

Note: There are also products available to produce colour enhanced/wet look with matt to high gloss finishes. Contact your TTA member for advice and product information.

6.4.5 Daily and weekly maintenance

Use a PH neutral cleaner.

6.4.6 Deep cleaning and renovation

If an impregnator has been used on the floor area, the floor can be deep cleaned with an alkali product. This will de-grease the floor and grouting areas, in preparation of a new application of impregnator. Dilute the product (if required)

Work in small controllable sections. Pour the diluted product onto a section, leave for 5-15 minutes depending on manufacturers instructions, scrubbing with a specific brush or with large areas a rotary machine with a white pad every 2-3 minutes to keep product evenly distributed. Add more diluted product if the area starts to dry as this can cause staining within the stone.

Once all grease and grime are removed, rinse with fresh water several times, removing all products and water with a wet vacuum or mop. Towel dry the marble, so no water marks remain.

If the floor to be renovated has had a build up of emulsions or waxes, a specific stripping agent (solvent or water based) should be used.

Work in small controllable sections. Pour the diluted or un-diluted product onto a section, leave for 5-15 minutes depending on manufacturer's instructions, scrubbing with a specific brush or with large areas a rotary machine with a white pad every 2-3 minutes to keep product moving and working. Add more product if the area starts to dry as this can cause staining within the stone.

Once all residues of wax, grease and grime are removed, rinse with fresh water several times, removing all product and water with a wet vacuum or mop. Towel dry the marble, so no water marks remain.

6.4.7 Crystallisation and polishing powders for polished marble floors

Please note that with crystallisation or powder polishes a test must be carried out to determine if the stone will restore using these methods.

6.4.8 Crystallisation

If the floor still has a degree of the original sheen and light scratching, this can be rejuvenated with the process of crystallisation. This process is completed with a chemical reaction between product and the use of a fine wire wool. The surface must be completely free of sealants and care products. Work in controllable sections; evenly distribute a small amount of product. Do not allow the product to dry on the surface, polish in immediately using a slow speed rotary machine until a high gloss finish shines through. This process can be repeated several times to improve the final finish. Always follow manufacturer's instructions.

6.4.9 Powder polishes

If the floor to be renovated has become so dull that it has lost its machined polish entirely, and is not to be re-ground the floor area can be cut back with polishing powders. This process is complete with a rotary machine and a white pad. Work in small controllable sections. Water the floor prior to use, add a small amount of the powder and slowly move the machine in all directions until a gloss appearance shows through. Do not let the floor dry. Add more water and powder if required. Once polish is regained, rinse several times and towel dry to remove water marks. Always follow manufacturer's instructions

6.5 Quartzite & sandstone

6.5.1 Pre-clean

Pre clean quartzite and sandstone with a pH neutral if required. Dilute in accordance with the manufacturer's instructions.

Wipe over stones with a cloth or sponge. If stubborn marks persist, use a white emulsifying pad to aid removal. Rinse and dry stones to avoid water marking. Note: the quartzite and sandstone must be completely dry before sealing.

6.5.2 Pre-seal

To be conducted according to manufacturers individual guidelines.

If recommended, use water or solvent based impregnators on sandstone but water based for quartzite, for interior and exterior use.

Note: follow instructions on curing and drying times before grouting can commence.

6.5.3 Grout removal

As some sandstones and quartzites may not be fully acid resistant, a test should be carried out on an un-laid stone or in an inconspicuous area prior to cleaning. Dilute the specific acid based product to the manufacturer's instructions and work in small controlled sections. Wash over the area and leave to act for several minutes agitating with a pad on polished or scrubbing brush on rough/honed to remove the residue. Rinse the area several times and towel dry so that no water marks remain. Repeat if required.

NB if these acidic products are to be used, it is advisable to test on an unused tile to check before application on installed tiling. If the stone appears to be adversely affected at the test stage or if a light residue is being removed from a polished surface, the stone should be tested with an alkali product with a white emulsifying pad.

Note: increase the drying times before the final seal if a deeper clean was required for the removal of the grout contamination.

6.5.4 Seal and surface coatings

Unpolished surface – suitable impregnator (water and oil repellent) Leaves a natural finish

Unpolished surface – suitable impregnator followed with a suitable wax or emulsion to give desired finish, matt, satin or gloss.

Polished surface - suitable impregnator (water and oil repellent) leaves a natural finish.

6.5.5 Daily and weekly maintenance

Use a pH neutral cleaner.

6.5.6 Deep cleaning and renovation

If an impregnator has been used on the floor area, the floor can be deep cleaned with a specific product. This will de-grease the floor and grouting areas, in preparation of a new application of impregnator. Dilute the product (if required)

Work in small controllable sections. Pour the diluted product onto a section, leave for 5-15 minutes depending on manufacturer's instructions, scrubbing with a specific brush or with large areas a rotary machine with a white pad every 2-3 minutes to keep product evenly distributed. Add more product if the area starts to dry as this can cause staining within the stone.

Once all grease and grime are removed, rinse with fresh water several times, removing all products and water with a wet vacuum or mop. Towel dry the quartz or sandstone, so no water marks remain.

If the floor to be renovated has had a build up of emulsions or waxes, a specific stripping agent (solvent or water based) should be used.

Work in small controllable sections. Pour the diluted or un-diluted product onto a section, leave for 5-15 minutes depending on manufacturer's instructions, scrubbing with a specific brush or with large areas a rotary machine with a white pad every 2-3 minutes to keep product moving and working. Add more product if the area starts to dry as this can cause staining within the stone.

Once all residues of wax, grease and grime are removed, rinse with fresh water several times, removing all product and water with a wet vacuum or mop. Towel dry the quartz or sandstone so no water marks remain.

6.6 Slate

6.6.1 Pre-clean

Pre-clean slate with a specific pH neutral product if required. Dilute in accordance with the manufacturers instructions.

Wipe over the stones with a cloth or sponge with the diluted product. If stubborn marks persist, use a white emulsifying pad to aid removal. Rinse and dry stones to avoid water marking. Note: the slate must be completely dry before sealing.

6.6.2 Pre-seal

To be conducted according to manufacturer's individual guidelines.

If recommended use water or solvent based impregnators, for interior and exterior use.

Note: follow instructions on curing and drying times before grouting commences.

6.6.3 Grout removal

On polished and very fine honed slate surfaces dilute a pH neutral or mild alkaline product to the manufacturer's instructions. Wash over the stones and leave to act for a few minutes, then use a white pad or sponge to remove the residue. Rinse and towel dry stones.

On rough and riven finishes, test the use of a specific acidic compound cleaner to remove the contamination. Dilute accordingly, test and strengthen the product if required.

Note: Increase drying times before the final sealing if a deeper clean was required for the removal of the contamination.

Note: if the stone appears to be adversely affected at the test stage or if a light residue is being removed from a polished surface, the stone should be tested with an alkali product with a white emulsifying pad.

Note: increase the drying times before the final seal if a deeper clean was required for the removal of the grout contamination.

6.6.4 Seal and surface coatings

Unpolished surface – to leave a natural finish apply a suitable impregnator (water and oil repellent)

Unpolished surface – to give the desired matt, satin or gloss finish apply a suitable impregnator followed by a suitable treatment with wax or emulsion.

Polished surface - – to leave a natural finish apply a suitable impregnator (water and oil repellent)

6.6.5 Daily and weekly maintenance

Use a PH neutral cleaner.

6.6.6 Deep cleaning and renovation

If an impregnator has been used on the floor area, the floor can be deep cleaned with a specific product. This will de-grease the floor and grouting areas, in preparation of a new application of impregnator. Dilute the product (if required)

Work in small controllable sections. Pour the diluted product onto a section, leave for 5-15 minutes depending on manufacturer's instructions, scrubbing with a specific brush or with large areas a rotary machine with a white pad every 2-3 minutes to keep product evenly distributed. Add more product if the area starts to dry as this can cause staining within the stone.

Once all grease and grime are removed, rinse with fresh water several times, removing all products and water with a wet vacuum or mop. Towel dry the slate, so no water marks remain.

If the floor to be renovated has had a build up of emulsions or waxes, a specific stripping agent (solvent or water based) should be used.

Work in small controllable sections. Pour the diluted or un-diluted product onto a section, leave for 5-15 minutes depending on manufacturer's instructions, scrubbing with a specific brush or with large areas a rotary machine with a white pad every 2-3 minutes to keep product moving and working. Add more product if the area starts to dry as this can cause staining within the stone.

Once all residues of wax, grease and grime are removed, rinse with fresh water several times, removing all product and water with a wet vacuum or mop. Towel dry the slate so no water marks remain.

6.7 Travertine

6.7.1 Pre-clean

Pre-clean honed and unpolished travertine with a specific pH neutral product if required. Dilute in accordance with the manufacturers instructions.

Wipe over the stones with a cloth or sponge. If stubborn marks persist, use a white emulsifying pad to aid removal. Rinse and dry stones to avoid water marking. Note: the travertine must be completely dry before sealing.

6.7.2 Pre-seal

To be conducted according to manufacturer's individual guidelines.

If recommended use water or solvent based impregnators, for interior and exterior use. Note: follow instructions on curing and drying times before grouting commences.

6.7.3 Grout removal

Dilute the alkali product to the manufacturer's instructions. Wash over the stones and leave to act for a few minutes, then use a white pad or sponge to remove residue. Rinse and towel dry stones. Note: Increase drying times before final sealing if a deeper clean was required for the removal of the contamination.

6.7.4 Seal and surface coatings

Honed and unpolished travertine – to leave a natural finish apply a suitable impregnator (water and oil repellent)

Honed and unpolished travertine – to give the desired matt, satin or gloss finish apply a suitable impregnator followed by a suitable wax or emulsion.

Polished surface - to leave a natural finish apply a suitable impregnator (water and oil repellent)

6.7.5 Daily and weekly maintenance

Use pH neutral cleaner

6.7.6 Deep cleaning and renovation

If an impregnator has been used on the floor area, the floor can be deep cleaned with a specific product. This will de-grease the floor and grouting areas, in preparation of a new application of impregnator. Dilute the product (if required)

Work in small controllable sections. Pour the diluted product onto a section, leave for 5-15 minutes depending on manufacturer's instructions, scrubbing with a specific brush or with large areas a rotary machine with a white pad every 2-3 minutes to keep product evenly distributed. Add more product if the area starts to dry as this can cause staining within the stone.

Once all grease and grime are removed, rinse with fresh water several times, removing all products and water with a wet vacuum or mop. Towel dry the travertine, so no water marks remain.

If the floor to be renovated has had a build up of emulsions or waxes, a specific stripping agent (solvent or water based) should be used.

Work in small controllable sections. Pour the diluted or un-diluted product onto a section, leave for 5-15 minutes depending on manufacturer's instructions, scrubbing with a specific brush or with large areas a rotary machine with a white pad every 2-3 minutes to keep product moving and working. Add more product if the area starts to dry as this can cause staining within the stone.

Once all residues of wax, grease and grime are removed, rinse with fresh water several times, removing all product and water with an wet vacuum or mop. Towel dry the travertine so no water marks remain.

7. Cleaning and maintenance of other tiles

7.1 Agglomerate tiles

Agglomerated stone products are manufactured from hydraulic cement, resin or a mixture of both, combined with stones and other aggregates. They are manufactured in a factory in block form. These blocks are then cut into slabs and tiles. The aggregate in these tiles may include quartz or marble, recycled glass or mirror glass.

Use a pH neutral cleaning product following the manufacturer's instructions.

Excessive use of water or harsh chemicals could be detrimental to resin based agglomerates. Seek advice where necessary.

7.2 Metal tiles

Care should be taken during installation and grouting to avoid damage of the surface from coarse abrasive materials. After grouting the surface should be cleaned off using a clean non contaminated sponge and the surface polished dry using a clean dry soft cloth.

During service the surface of the metal tiles should be cleaned with a pH neutral detergent. Metal tiles should not be cleaned with abrasive or acid based cleaners.

7.3 Glass tiles

Glass tiles can be cleaned with water, generic glass or microfibre cleaning products. It is also possible to use ceramic tile cleaning products provided they do not contain abrasive materials.

8. Cleaning and maintenance programmes

8.1 Ceramic tiles

8.1.1 Installation

8.1.1.2 Ceramic tiles

In general fully glazed ceramic tiles do not require cleaning before installation.

8.1.1.3 Quarry, encaustic, geometric, Victorian tiles

In general these tiles do not require cleaning before installation.

8.1.1.4 Polished ceramic tiles

In general polished tiles do not require cleaning before installation, however some polished tiles have a wax coating applied at the factory, which may need to be removed. Consult the tile manufacturer.

8.1.1.5 Terracotta tiles

Terracotta tiles will require a certain level of cleaning and maintenance; this will depend on the surface finishes, coatings and level of wear.

8.1.1.5.1 Daily and weekly maintenance

Use a specific pH neutral cleaner. Follow manufacturer's instructions.

8.1.1.5.2 Monthly/annually maintenance

It is important to regularly maintain a terracotta floor. The surface finish can be maintained in several ways. If the floor has been originally waxed, and if wear marks or walkways are appearing on the floor the area should be waxed to level the finish. It is important to ensure there is no wear to the tiles through lack of seal. If the floor has had an emulsion applied this can be topped up either by a neat coat or diluted in water and mopped through following the manufacturer's instructions.

Note: if the floor is heavily soiled do not add product to the area as this will trap the dirt in between layers of sealant or wax. Follow instructions for a deeper clean.

8.1.1.5.3 Deep cleaning and top up

In some cases the floor may be very dirty, but the sealants intact. These areas can sometimes be deep cleaned without stripping away the surface finishes. The floor can be deep cleaned with a diluted alkali product. This will degrease the surface of tile without breaking into the sealant. After testing you may find the sealant has dulled slightly. After a drying time the floor can be re-sealed with the surface sealant or wax finish to regain the desired effect.

Note: It is important to keep moisture to a minimum by working in small controllable sections so that the cleaning product is on the floor for a minimum time, thus not affecting the seal. Carry out a complete run-through of this process in an inconspicuous area.

8.1.1.5.4 Spot cleaning

Greases and oils

Light greases and similar contaminations may be removed with a mild, heavily diluted alkali cleaning solution, with the light use of a white emulsifying pad. Always test in an inconspicuous area. Some cleaners may dull the surface finish as they clean, these areas will need to fully dry and then the correct surface finish replaced.

Note: Spot cleaning and stripping back on individual tiles can be quite challenging, as it is very difficult to match new finishes against aged waxes and emulsion floor. In some cases a completely clean tile in an area of aged tiles is sometimes more unsightly than a small stain on an aged floor.

Calcium deposits/salts and efflorescence

With some textured terracotta, deposits may be left on the surface from general maintenance. The use of a light acid/specific remover (following manufacturer's instructions) may be used. In some cases, depending on the severity of the contaminant, the floor finish may become dull and a finishing coat will need to be topped up.

In cases where salts and efflorescence are present under the seal and in the tile (for example flood damage), the surface finish will need to be removed first with a stripping agent and then the salts removed with an acidic product.

Acid damage

Acidic damage from products such as wine, vinegar or juice, may etch the surface finish. A test sample should be undertaken by applying a further top coat of sealant or wax, to establish if this may disguise the damage. If this is not possible the contaminated tile can be stripped back and resealed.

8.1.1.5.5 Renovation

If the floor area is to be renovated (full strip and re-seal) the use of a specific stripping agent (solvent or water-based) may be required to remove all waxes, oils, emulsions or other finishes.

After the initial tile test, work in controllable sections. Pour the neat or diluted stripping agent onto a section, leave for 5-15 minutes (depending on test tile results, or manufacturer's instructions) scrub over the area with a hand brush or with larger areas a rotary machine and brush set.

Note: The use of abrasive pads on certain tiles can seriously damage the surface of terracotta with irreversible effects to the surface glaze/finish and, therefore, should be used with caution.

It is important to keep the product moving and not allow it to dry out, if this happens add more stripper. When the waxes, sealants and general contaminates have been removed, rinse with fresh water several times. Towel dry the surface of the tile, so that no watermarks remain.

8.1.2 Initial cleaning after fixing of tiles

This is the cleaning programme after tiling has been completed and before handing over to the main contractor or client.

The grouting process may leave a residual film on the surface of the tiles. It is important that this film is completely removed prior to the floor being brought into service. Residual cement film can be removed by treatment with appropriate proprietary acid cleaners. The floor should be wetted and free water removed prior to the application of the cleaning agent. It is important that this treatment is followed immediately by a thorough rinsing with clean water.

Proprietary products should be used in strict accordance with the manufacturer's instructions.

Note: Temporary tile sealers may be used to facilitate cleaning-off after laying and grouting and are recommended to prevent potential staining from coloured grouts.

These proprietary compositions can be readily removed after completion of the grouting operation by using normally alkaline detergents and rinsing.

Where temporary sealers are employed they should be used strictly in accordance with the manufacturer's instructions.

8.1.3 Routine cleaning

8.1.3.1 Manual cleaning

As frequently as is necessary, ceramic tiles require little maintenance and are easily kept clean by sweeping and then mopping with warm water to which a pH neutral detergent has been added. The frequency of cleaning will be determined by use

It is the detergent that facilitates the remove of residue or contamination.

Whichever detergent is used, it should be used in accordance with the manufacturer's instructions. The cleaning solution needs time to work and should be left for a period of time (see manufacturers instructions) to allow it to penetrate and emulsify the dirt, after which it should be removed by rinsing thoroughly with clean water.

8.1.3.2 Mechanical cleaning

The normal cleaning recommendations described above will suffice to keep a ceramic floor in a satisfactory clean condition. However, large areas of plain or textured surface floor tiles are more readily cleaned with mechanical scrubbing machines. These would fall into three main categories:

* Rotary Action :

Whichever rotary machine is selected it should not be operated at speeds in excess of 450 r.p.m

* Contra-rotating :

Multiple brush heads make this type of machine easier to handle than the rotary action. However, its scrubbing action is less effective.

* Cylindrical :

These machines tend to be light and extremely mobile. Most machines of this type feature bi-directional movement and are able to wash, collect dirt and remove surface water in one operation.

Having selected the most suitable type of machine the choice of brush heads is all important. The brushes have to be flexible enough to grip the floor and at the same time they must not be of a type to cause damage to the tiles or joints.

Two different types of brushes are recommended:

* Union Mix Brush :

For washing tiles with a light scrubbing action.

* Polypropylene Brushes :

Where the deposits of dirt are especially heavy.

Use the appropriate pad.

Many scrubbing machines are now provided with a suction drying facility. If so equipped the machine should first be used with the suction facility switched off to permit the water detergent solution used in the scrubbing process to remain on the floor to penetrate and emulsify the dirt layer.

The detergent solution should remain on the floor for the period of time recommended by the manufacturer of the cleaning product after which time scrubbing operation should be repeated, but with clean water only, and with the suction drying facility switched on.

High Pressure Cleaning

High velocity cold or hot water jetting equipment is in use in industrial locations particularly for the removal of obstinate deposits which defy normal cleansing techniques such as dirt and grime present in heavy concentrations or in relatively inaccessible areas.

Check with the manufacturer that the type of cleaning is appropriate.

Because of the ease with which ceramic tile surfaces, both unglazed and glazed, can be maintained in a clean condition, high pressure equipment is not often used on such surfaces, but where it is employed the following points should be noted:

a) Whilst tiles will not be affected by high water pressure, excessive pressures may abrade the grouting material in the joints. For this reason care must be taken when using high pressure water jetting equipment to ensure that the water is not concentrated on one point for too long, but sprayed evenly across the entire surface being cleaned.

b) Sometimes abrasives, detergents and disinfectants are added to the high velocity water. Whilst correctly proportioned mixes of suitable detergents or disinfectants in water should not harm tiles or grouting material, abrasives added to the water may produce damage. Therefore, water incorporating abrasive materials should not be sprayed over the tile surface.

The use of steam cleaners is not recommended as they can cause stresses of the tile which may result in adhesion failure.

8.1.4 Periodic deep cleaning

All ceramic tiles will require a general maintenance schedule, when a deeper clean is required i.e. spring clean or a general refreshing of the surface finish. Any stubborn stains (e.g. rubber shoe marks, light oil stains) can normally be removed with special proprietary deep cleaner.

Care should be taken with these deeper cleaners, as excessive use can have an effect on surface sealants and polishes that have been used. Always follow manufacturer's instructions or contact them for detailed instructions of use.

Household and commercial cleaning products must be used with caution as they may contain bleaching agents, or ingredients that may burn or discolour stone finishes. Contact The Tile Association for advice.

If stains have occurred the following treatments will normally remove or minimise them, though the treatment should only be used on the offending mark. It is advisable to experiment on a small area first, particularly if the nature of the stain is in doubt.

8.1.5 Renovation of tiles

Seek advice from a TTA member company that specialises in renovation or restoration

8.2 Natural stone

8.2.1 Installation (pre- cleaning)

Pre-cleaning natural stone is an important process before sealing, as this can remove adhesive residues, greases, quarry dusting and grime that may be on the surface or trapped in the small pores/capillaries or of the stone. This can lead to staining/shadowing remaining under a surface sealer or being enclosed within the impregnator. Light washing, followed by rinsing, is recommended, but not to fill up and saturate the un-grouted joints because the stone will need to be completely dry before the first seal. Several cleaning agents can be used on different stones according to the make up and properties of each type of stone.

Please note that some stones may be perfectly clean and the pre-clean may not be required at all.

8.2.2 Installation (pre-sealing)

Ensure the stone is clean and dry. Pre-sealing the stones may involve the use of an impregnator, either solvent or water based. These products will penetrate porous surfaces, filling the capillaries with a film that will repel water, as well as oil and grease. These contaminants are not then absorbed into the surface of the stone, whilst the fitting process takes place.

Pre-sealing stones will also greatly facilitate the removal of the grouting and grouting residue. It will also protect against possible bleed, tram-lining or picture framing. These expressions describe the shadowing that an unsealed stone can show if the

face and edges are not sealed. This effect is caused by moisture, sometimes contaminated with grout colourant, which can be absorbed into the edges of most natural stones, especially the more porous ones. Such staining can be very difficult to remove from calcite based stones, as normally it would require an acidic cleaner to remove. In these cases, the body of the natural stone is attacked before the grout based contaminant is removed.

Please note that some sealant manufacturers may recommend a minimum time before the grouting process is commenced in order to leave sufficient curing time for impregnators/sealers. Always follow manufacturer's guidelines.

8.2.3 Installation (grout removal)

After the grouting is completely dry, and before the final sealing is commenced, the floor may need a gentle wash to remove any residue of grouting, or any grease or grime marks that may have occurred during the preceding processes.

If the natural stone has been pre-sealed as described in 6.2, the removal of grout residues will be much easier. If any residue still remains on limestone, marble or travertine or other stone prone to acid attack, however, before the final seal, a mild alkaline product formulated specifically for this process can be used in conjunction with a white emulsifying pad. Always follow the manufacturer's instructions. It is recommended to clean a test area. If the problem persists contact the appropriate TTA Member for product and application advice.

On stones which may be acid resistant, i.e.; some slates, granites and sandstones, a light wash with a mildly acidic product (diluted, as per instructions) that is specifically for this process may suffice. Again, it is recommended to treat a test area. Wet out the surface area with clean water, pour the diluted product onto the test section and use a white emulsifying pad to clean the stone, which will aid the removal of contaminants on polished and fine honed surfaces. Use a brush for riven surfaces. All areas will need to be rinsed and towel dried, to avoid water marks.

Note: Acid cleaning will always require a test to be made before treating the full area, especially on polished stone which readily shows dulling of the surface, if they are even slightly prone to acid attack. It is also a good idea to make a test on an un-laid sample tile.

8.2.4 Installation (final seal and surface coatings)

Final seal

In a wet or exterior location an impregnator seal is required.

After ensuring that the floor is clean and dry, make the final application of impregnator. This will ensure that the stone is fully sealed and will make the new grouting, oil and water repellent. Follow manufacturer's instructions for the best results.

An impregnator will be sufficient for exterior use, or wet areas. Surface sealants in these applications can cause problems if moisture breaks into or behind the seal.

Surface Coating

Surface coatings are not suitable in wet or exterior locations.

Surface sealants, waxes and acrylic emulsions may be used for several reasons. Cosmetically they will produce the appearance that the client requires, sheen or gloss. They may also ease maintenance by filling surface capillaries or micro toughness with product, thereby making the surface smoother and less prone to dirt ingress.

Please note: always test a separate stone before application; polished and fine honed will require different products to rough and sawn finishes. Always consult your TTA supplier for advice on application and product advice.

Stone floors that have had a protective coating applied (paste waxes or acrylic emulsions), may need topping up when wear begins to show. Some will require a full application of the protective coating (waxes); others can be diluted into water. If the floor is to be topped up with a surface finish the area should be pre-cleaned with the daily cleaner/or deeper cleaner if required, left to dry and then topped up in a separate application as not to seal in dirt. Always follow manufacturer's instructions.

8.2.5 Routine maintenance

Using the correct maintenance products for natural stone is not only the key for the longevity of the sealants and impregnators but also ensures the stone remains protected and in good condition.

Damage can occur to a stone finish by misuse or incorrect maintenance due to inadequate instructions. Clients or personnel, responsible for the maintenance of such floors, should ideally be given full information by the supplier; this includes a full cleaning and maintenance schedule, which in many cases can be supplied by the sealant manufacture.

Ideally all stone floors will be vacuumed (brushes down) or brushed to remove any surface grit and dust. The floor will then be washed over using a stone specific neutral cleaner, which is ideally applied with a sponge mop (larger areas can be completed with driven cleaning machines). This should ensure that any excess water and dirt is carried away and not left on the surface or in grout joints to evaporate. Some daily cleaners may need rinsing other will require natural drying, always follow the manufacturers instructions for best results.

8.2.6 Deep cleaning and renovation

All stone floors will require a general maintenance schedule, when a deeper clean is required i.e. spring clean or a general refreshing of the surface finish. Any stubborn stains (e.g. rubber shoe marks, light oil stains) can normally be removed with special multi-purpose cleaner. Care should be taken with these deeper cleaners, as excessive use can have an effect on surface sealants and polishes that have been used. Always follow manufacturer's instructions or contact them for detailed instructions of use. Household and commercial cleaning products must be used with caution as they may contain bleaching agents, or ingredients that may burn or discolour stone finishes. Contact The Tile Association for advice.

Full renovation of stone areas generally requires the removal of all surface waxes/sealers to be able to clean deep into the pores of the stone and grouting joints, so they may appear as they did when first laid. The use of a solvent or water based stripper may be used to remove these from the stone. After an initial test, the key is to work in small controllable sections. Never let the stripping agent dry into the stone, as this can lead to staining within the stone. Always rinse completely in some

cases several times, always towel dry you're stone to prevent water marks/staining. Always follow manufacturer's instructions.

9. Cleaning and maintenance of wall and floor tile grout

9.1 Initial cleaning

9.1.1 Ceramic tiles

Cement based grout residues on tiles are normally removed during the installation procedure and any residues remaining on the face of the tiling usually consist of a thin film that is easily removed during routine cleaning. If thicker deposits of grout mortar are inadvertently left on the face of the completed tiling these can be easily removed using proprietary acidic cleaners based on phosphoric and similar acids. Before applying the acidic cleaning agent, the tiles should be wetted to saturate the dry grout with water and any surplus water removed. Treatment should be followed immediately by thorough rinsing with clean water and drying. It is always advantageous to pre-wet dry cement based grout before applying acidic cleaners so that the effects of acidic cleaner are confined only to the surface of the grout so that any etching is minimised.

Where reaction resin grouts have been installed any surface residues of grout mortar should have been removed from the face of the tiling before the grout mortar sets and hardens. Removal of such residues, other than a thin film can be difficult and require special chemicals once the grout has hardened. This may necessitate several applications.

9.1.2 Natural stone

See section 6

9.2 Routine maintenance cleaning

Cement based grouts

Routine cleaning of the tiling is usually sufficient to maintain the cleanliness of the cement based grout in the tile joints using cleaning materials designed specifically for the maintenance of ceramic tiling. In situations where the surfaces of the joints are usually slightly recessed below the surface of the tiles contaminants can sometimes accumulate on the surface of the grout and their removal can require the use of additional measures. This will normally require the use of brushing, in addition to the application of routine cleaning materials designed specifically for the maintenance of ceramic tile joints.

Reaction resin grouts

The cured joints are chemically resistant and will normally withstand the effects of most common cleaning and maintenance products designed for use with ceramic tiles. These grout mortars are usually specified where regular and heavy cleaning of the tiled surface is necessary and the use of a cement based grout would not be appropriate.

Ceramic tile joints

There are specific requirements when cleaning the joints between ceramic tiles in so far as the cleaners used should have no adverse effects on the installed tiling. With glazed tiles any components in the cleaners and maintenance products used should not scratch the glazed surface.

Natural stone tile joints

The cleaners used for the grout in the joints between natural stone tiles should have no adverse effects on the installed stone tiling. The use of cleaners and maintenance products specifically designed for the type of stone should be used so that cleaning the joints will have no detrimental effects on the stone tiling.

9.3 Renovation of grout:

Over a period of time the grout lines between the tiles may become stained or discoloured. There are also proprietary products available to 'refresh' the joints as a cosmetic application to restore the original appearance.

10. Removal of stains

10.1 Ceramic tiles

10.1.1 Red wine/strong coloured staining

To remove most deep coloured stains, the use of a diluted alkali general purpose cleaner should be tested in an inconspicuous location before use. If staining or shadowing remains after several washes contact your specialist TTA member for advice.

10.1.2 Urine

Urine staining will consist of part colour and deposit. A diluted general purpose alkali based product can be used. This may need to be saturated on the stain for a longer period so that it has time to break down the deposit. The use of a white emulsifying pad or brush will aid the removal of this contaminant.

10.1.3 Efflorescence

Efflorescence, in some cases, is aggravated by excessively damp conditions following installation (for example over wetting of screeds, adhesives and grouts). The deposits may disappear with washing, but may reappear when dry.

Persistent deposits may be treated with an appropriate acidic cleaner; this should be diluted to the manufacturer's recommendations and applied to a pre-wetted surface. This can be used in conjunction with the use of a white emulsifying pad or a brush on textured surfaces. Once removed rinse well several times and dry.

10.1.4 Limescale

Use a specialist ceramic limescale remover to remove limescale, built up water marking and general calcium deposit. This will generally consist of a concentrated combination acid. The tile should be tested in an inconspicuous area first.

Always use on a wetted surface and leave to work for 5-15 minutes depending on the manufacturer's instructions and stubbornness of deposit. Use a pad or brush to agitate and remove the contaminant during this period. Once removed, rinse with clean water. Re-apply if contaminant persists.

10.1.5 Paints

A test should be carried out with a general purpose alkali cleaner for the removal of emulsions and water based paints. These should be diluted following the manufacturer's instructions. Leave the product on the contaminant for 5-15 minutes, this may soften or remove the paint. The use of a scrubbing brush or a white emulsifying pad may assist with the removal of more stubborn staining.

For the removal of gloss/solvent paints a test with a solvent based stripping agent may be required. Pour the product onto the paint, leave for 5-15 minutes following the manufacturer's instructions, removing the product as directed. The use of a scrubbing brush or a white emulsifying pad may assist with the removal of the paint and product.

10.1.6 Rust and iron staining (oxides)

Use a specific product with reactive properties. This will convert the rust making it water soluble so that it can be rinsed away with water.

Cleaning times are relatively short, 2-5 minutes is typical for these types of cleaners on the surface of the tile. If the rust contaminant has bled to the grout joint, longer cleaning times and a greater dilution may be required as not to disturb colour or texture of the grout.

Always test in an inconspicuous area and follow manufacturer's instructions.

10.1.7 Rubber marks, oils, fats, tea and coffee

For general stain removal use an alkali-water/solvent based product. If deep oil stains remain, the use of a solvent cleaner may be required. The use of paste poultices can often be used to lift out deeper oil staining in the grout joint.

10.1.8 Mould and mildew (black and green algae spores)

Use a specific ceramic tile mould/mildew remover, preferably one which inhibits future mould growth. In many cases, the use of a white emulsifying pad can be used to remove a surface contaminant.

Some products may need time to permeate the product for full effect. Rinse heavily with clean water several times after use.

Always test in an inconspicuous area and follow manufacturer's instructions.

Note: Never use with other products present as this may create harmful gases.

10.1.9 Soot and fire damage

Initial cleaning should be with a mild alkali cleaner using a white emulsifying pad or brush. Soot and carbonaceous deposits are not soluble so a brush will be required with the cleaner.

If staining persists, a solvent based cleaner should be tested. Work in a small section so that the diluted staining does not wash into the tile and grout joint. If possible use a wet vacuum cleaner to take dirty water away. Rinse thoroughly with clean water.

Always follow the manufacturer's instructions.

10.1.10 Other types of stains

Contact a specialist TTA member

10.2 Natural stone

10.2.1 Rust and iron staining (oxides)

Natural stones often contain traces of iron, which may oxidise when in contact with water either through rain or cleaning processes. The result of this oxidation is that the stone develops rust and discoloration. Surface contamination may also occur from iron containing fertilizers and metal garden/indoor furniture.

Limestone, travertine and marble type stone containing calcium

Specific product with reactive properties, convert the rust, making it water soluble, so that it can be rinsed away with water. Cleaning times are fairly short, 5-6 minutes is typical for these types of cleaners; always test and follow manufacturers' directions.

Slates, granite and sandstones - Acid resistant stones

These harder acid resistant stone types, may require an ortho-phosphoric acid based product, which will chemically change rust, thereby removing discoloration regardless of whether it is a result of iron naturally in the stone or from environmental influences. Cleaning times may be longer for this process 1-4 hours in some cases, always test and follow manufacturer's directions.

10.2.2 Oil, tea, coffee and general food staining

For general stain removal use an alkali water based product. (Refer to deep cleaning). If deep oil stains remain the use of a solvent cleaner may be required, or paste poultices can often be used to lift out deeper oil staining over a longer period of time.

10.2.3 Acidic staining/damage including wine/vinegar and fruit juices

In some case impregnators and surface finishes may not hold long term acid attack, impregnators may not hold these contaminants and they may leave a coloured or colourless stain.

If a colour is still remaining, try a mild alkaline cleaner, diluted to the manufacture instructions. If the staining remaining and clear, be aware on non acidic stones the surface may have been damaged by the acidic contaminant. This may have removed the softer particles of the stone; in some cases these can feel slightly rough to the touch.

This damage may need to be professionally polished out, and the factory finish re-produced.

If the stones have been finished with a surface sealer/wax, the finishing coating may have been damaged. In these cases the stone area may be stripped of the coating, when the stone is completely dry it can be resealed with the original products.

Note: This type of stain includes ketchup, mayonnaise, brown sauce and salad dressings.

10.2.4 Mould and mildew

Use a specific mould/ mildew remover, preferably one which inhibits future mould growth. In many cases a mild alkali cleaner with the use of a white pad can be used to remove a surface contaminant. Some products may need to be allowed time to permeate the stone for full effect. Rinse several times. Always test in an inconspicuous area and follow manufacturer's instructions.

10.2.5 Soot and fire damage

Initial cleaning can be tried with a mild alkali cleaner, white pad or brush. Soot and carbonaceous deposits are not soluble, so a brush will be required with the cleaner. If staining persists a solvent based cleaner can be tested. Work in small section so diluted staining does not wash into the stone, if possible use a wet vacuum to lift dirty water away. Rinse thoroughly. Always follow manufacturer's instructions.

10.2.6 Efflorescence

Efflorescence should disappear with washing but can reappear after drying it should diminish with progressive washing and the most effective treatment is to increase the frequency of washing until the deposit ceases.

Persistent efflorescence can be treated with appropriate proprietary cleaners following the manufacturers' instructions. It is important that this treatment is following immediately by thorough rinsing with clean water and drying.

10.2.7 Limescale

Use a specialist natural stone limescale remover intended for natural stone, built up water marking and general calcium deposit which will be dependent on the acid sensitivity of the stone in question. The tile should be tested in an inconspicuous area first.

10.2.8 Flood damage

Long term flood damage may produce a lot of calcium carbonate or salts and water marking, on non acid resistant stones, test (with a diluted mild alkali cleaning agent and use a white pad to try to remove contamination). Clean and rinse sparingly to keep water ingress to a minimum. Always follow manufacturer's instructions.

Acid resistant stones may be washed with a diluted mineral acid based product to remove contaminate, but always test these products in an inconspicuous area. Clean and rinse sparingly to keep water ingress to a minimum.

10.2.9 Red wine

To remove most deep coloured stains, the use of a diluted alkali general purpose cleaner should be tested in an inconspicuous location before use. If staining or

shadowing remains after several washes contact your specialist TTA member for advice.

10.2.10 Urine

Urine can create an acid etch on acid sensitive stone and in some case impregnators and surface finishes may not hold long term acid attack, impregnators may not hold these contaminants and they may leave a coloured or colourless stain.

If a colour is still remaining, try a mild alkaline cleaner, diluted to the manufacture instructions. If the staining remaining and clear, be aware on non acidic stones the surface may have been damaged by the acidic contaminant. This may have removed the softer particles of the stone; in some cases these can feel slightly rough to the touch.

This damage may need to be professionally polished out, and the factory finish re-produced.

If the stones have been finished with a surface sealer/wax, the finishing coating may have been damaged. In these cases the stone area may be stripped of the coating, when the stone is completely dry it can be resealed with the original products.

10.2.11 Other types of stains

Contact a specialist TTA member

11 Appendix 1 – checklist

- Make sure you correctly identify the surface before cleaning
- Always read and follow the instructions supplied with cleaning and maintenance products.
- Always test in an inconspicuous area or on an unfixd tile
- Follow the manufacturers instructions
- Be aware of the hazard signs on cleaning and maintenance products.
- Protect adjacent surfaces when applying cleaning materials
- Use the correct containers that will not be damaged by the cleaning chemical
- Do not blend chemicals together
- Wear the correct personal protective equipment
- Some processes are irreversible, seek professional advice if you are unsure

12 References and bibliography

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BS EN 14411: 2006 Ceramic Tiles

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The Tile Association Documents:

Slip Resistance of Hard Flooring

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Health & Safety Executive:

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