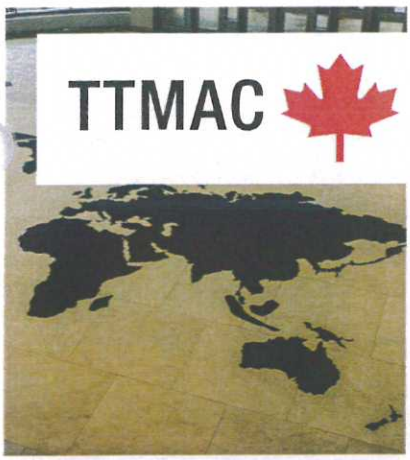
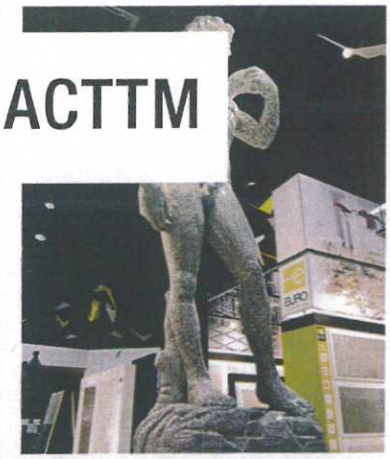
TTMAC ACTTM





2017-2019 HARDSURFACE MAINTENANCE GUIDE

PROFILE OF TTMAC

The Terrazzo, Tile and Marble Association of Canada was founded in 1944. Its mandate was to develop a method of standardizing terrazzo, tile and marble installation techniques, as well as being a technical resource and liaison for architects, specifiers, designers and engineers. TTMAC honours this commitment today as well as many other services and support of the hardsurface industry and its members.

ASSOCIATION ACTIVITIES & BENEFITS

- Produces and distributes specification guidelines.
- Sets standards for installation methods used in the industry.
- Promotes technical research, new materials and techniques.
- Maintains an up-to-date library resource center.
- Encourages development of new technology and products.
- Is a door to the industry in Canada with a global outlook.
- Publishes newsletters, maintains and circulates an annual Membership Directory and Buyers Guide.
- Provides a liaison with other associations, government departments, trade magazines, trade commissions, and those interested in sharing information for the good of the industry.
- Offers independent arbitration of complaints and site inspections.
- Promotes an annual convention, seminars and workshops. Provides general information to architects, specifiers, engineers, contractors, designers and the building industry in general.
- Encourages and promotes the installation of terrazzo, tile, marble, granite, slate and other dimensional stone products and related materials.
- Has a technical representative on staff.
- Promotes TTMAC members and products.
- Assists in setting training standards and distributes information to further develop training in the hardsurface industry.

SPECIFICATION STUDY ON MAINTENANCE

The Terrazzo, Tile and Marble Association of Canada provides this Maintenance Guide to assist in clarifying and standardizing installation maintenance procedures for hard surface material and related products.

It is the responsibility of the architect/specifier or qualified consultant to clearly specify in detail requirements for the complete maintenance of the hard surface materials, products, systems, related sections, warranty and guarantees.

The Terrazzo, Tile and Marble Association of Canada does not accept liability for the information presented by this document. Readers are expected to make judicious use of data in this guide as part of the quest to further their knowledge.

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TILE SPECIFICATIONS AND GUIDES

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ACKNOWLEDGEMENTS

The Terrazzo, Tile & Marble Association of Canada appreciates the assistance of the following in the preparation of this guide.

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Construction Specifications Canada (CSC)
The National Terrazzo & Mosaic Association Inc. (NTMA)
The National Tile contractors Association (NTCA)
Terrazzo, Tile & Marble Guild of Ontario, Inc. (TTMGO)
Terrazzo, Tile & Marble Trade School Inc. (Ontario) (TTMTS)
Tile Council of North America (TCNA)
Trowel Trades Training Association (TTTA)

This guide supersedes the 2008 Maintenance Guide

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FOREWORD

Reproduction for distribution, commercial or advertising purposes shall not be made without the permission of the Terrazzo, Tile and Marble Association of Canada and Construction Specifications Canada. The Terrazzo, Tile and Marble Association of Canada and Construction Specifications Canada do not accept liability for the information presented in this document. Readers are expected to make judicious use of data in this guide as part of the quest to further their knowledge.
Insist on products and services from TTMAC members. Refer to the TTMAC Membership Directory and Buyers' Guide for materials and services.
Reference - Products should be qualified by standards of the Canadian General Standards Board (CGSB)

1. Detergent general purpose, liquid cleaner CAN/CGSB-2.107-92
2. Remover for water emulsions, floor polish and wax CAN/CGSB-2.60-95
3. Detergent, germicidal, general purpose liquid CAN/CGSB-2.160-95
4. Surface sealer for floors CAN/CGSB-25.20-95
5. Detergent resistant floor polish CAN/CGSB 25.21-95
6. Silicone Impregnator (CGSB - no standard)

Further information on CGSB, its services and standards may be obtained from: Canadian General Standards Board (CGSB) Ottawa, Canada K1A 1G6 (800) 665-2472 web site: www.pwgsc.gc.ca/cgsb

PREFACE

Sources for maintenance products are located in the TTMAC Membership Directory and Buyers' Guide or by visiting www.ttmac.com. The members of the Terrazzo, Tile and Marble Association of Canada are continually striving to maintain and improve the standards of the terrazzo, tile and natural stone industry in Canada. This maintenance guide has been compiled as a means of simplifying and standardizing maintenance procedures for terrazzo, tile and natural stone installations. The comments and data contained within this guide are based on standard practices and the experience of members of the Association. Further information regarding installation is available by obtaining additional specifications and guides published by the TTMAC.

Any questions regarding this guide or suggestions towards its improvement are welcomed by the Terrazzo, Tile and Marble Association of Canada. New and improved maintenance products and techniques will be under constant review by the Association and its members, and will be considered for inclusion in future revisions to this maintenance guide.
Although great care was taken in compiling this maintenance guide, it is impossible to encompass all situations and products. This guide is intended as a general recommendation to the proper maintenance of hard surfaces. With appropriate maintenance procedures hardsurface products will last a lifetime.

Architects, Designers and Specifiers

To promote use of this guide and ensure correct maintenance procedures, we recommend the insertion of the following paragraph in your specifications.

1.2 Quality Assurance

.1 The work of the Subcontract shall be executed by a company who is a member in good standing with the Terrazzo, Tile and Marble Association of Canada. This work shall be done under proper supervision by persons skilled in the methods following the recommendations of the manufacturer of the products involved and having a minimum of two years proven experience and must provide at least three projects of similar size and scope.

Sources for maintenance products can be found in the TTMAC Membership Directory and Buyers' Guide or by visiting www.ttmac.com.

1.6 Maintenance

.1 Submit four (4) copies of TTMAC latest edition maintenance guide for inclusion in the data book. Give specific warning of any maintenance practice or materials which may damage, or disfigure the finished work, or alter the coefficient of friction (slip resistance) to the finished surface.

USE OF GUIDE

The purpose of this guide is to provide general information for care and maintenance of floor and wall hard surfaces. The use of this guide is important to coordinate maintenance procedures with the manufacturer of the hard surface product as well as the manufacturer of the maintenance products. In situations out of the ordinary, we suggest that you consult your Manufacturer, Supplier or Contractor.

Treating New Work

Treating new terrazzo, tile and natural stone installations includes steps to be taken at an appropriate time after installation, and prior to the owner taking responsibility for the maintenance of the surface. This initial treatment plays an important part in the future appearance and performance of the surface.

Recommended Care and Maintenance

These procedures are the regular day to day requirements to maintain the cleanliness as well as the original condition of the installation. These procedures will include both a more frequent preventative maintenance of the surface, as well as a periodic thorough cleaning of the surface. Clean water should be used and the frequency of these operations will be determined by the type of hard surface material, amount of traffic, the type of soil and the level of cleanliness desired. Seasons of the year will also have a direct impact on the frequency of these operations. The owner is well advised to implement an appropriate maintenance schedule for their particular use and conditions.

Cautionary Note Pertaining to Epoxy Grout

Not all cleaners are compatible with epoxy grout therefore verify with manufacturers of both the cleaner and epoxy grout for compatibility prior to installation.

Reconditioning Existing Work

Surfaces that have been neglected or are in need of a more abrasive restoration in order to restore the surface to its original condition will require the suggested reconditioning work in this manual. These procedures apply to all hard surface materials. The need to recondition will often be determined by the frequency and effectiveness of a regular maintenance program.

SEALERS

Due to the technological advances in the tile and stone industry, sealing is not only accepted, but in many cases specified. The theory is to make the surface easier to keep clean and pristine by using an impregnator or penetrating sealer.

The only way to protect the surface is to penetrate it with something that will carry the protection into it. The protection can be silicone, silanes, siloxines, fluoropolymer: new generation acrylic (no wax), etc. But it has to be carried into the surface and typically it will be one of two vehicles: solvent or water.

Solvents will allow varied and typically deeper penetration into the surface than water. The curing process, which is a result of evaporation in most cases, can be adjusted by using different solvents. Solvent based and water based products can be cross-linked, have better durability and typically are unaffected by exposure to cold during storage and transportation. Note that silicone sealers cannot be cross-linked in a water carrier. Consult with manufacturers' recommendation at all times.

Water is hydroscopic and remains on the surface. The protection cannot penetrate any deeper than the water will. For many dense substrates like porcelain or polished granite, water will not penetrate very deeply leaving the protection on the surface, hence the poorer durability to the wear and tear in the long term. Any polymer can be emulsified, but unlike solvent based products, some cannot be cross-linked (cured) to give the best performance and durability.

It is important to remember to consider all manufacturers' information when evaluating the potential danger of using a particular solvent or water based product.

USE OF SEALERS

Sealers are of two basic types:

Impregnating/Penetrating Sealers – sealers that penetrate in to the pores of the hard surface material and repel water (and in some cases oil) borne stains. Penetrating sealers may alter the appearance of the surface and do not leave a glossy film. Consult with manufacturers recommendations. On very porous surfaces you can apply a penetrating sealer as a primer and on the top of it a topical one. The last one will be the sacrificial sealer. The stain will damage it without touching the primer.

Topical Sealers – sealers that provide not only a glossy appearance but a matt finish as well to the surface of the material.

The choice of which type of sealer to use depends upon factors such as:

- Desired Appearance - if a high gloss appearance is desired, apply a topical sealer rather than a penetrating sealer that will not increase gloss.
- Type of Surface – unless recommended by the tile manufacturer, sealers are generally not used on non-absorptive surfaces such as porcelain tile or glazed tile but may be used to protect the grout joints from staining. (Note: 100% solid epoxy grouts, which are non-absorptive, do not benefit from application of sealers.) Penetrating sealers are commonly used on natural stone surfaces and particularly on low gloss surfaces such as honed marble, limestone or sandstone where one wishes to preserve the natural appearance of the stone.
- Limitations of topical Sealers – do not permit vapor transmission. It can make surface more slippery.

Application of Sealers

Sealers should only be applied on clean, dry surfaces. Failure to properly clean a floor before application of sealers may aggravate maintenance problems by sealing in dirt or stains.

Importance of Maintenance

Hard surface floor and wall materials are durable, economical and are the easiest to maintain surfaces available. These products will last the life of the structure if properly installed and well maintained. It should be noted, however, that different products show different wear characteristics and as a result, will require different levels of maintenance. Hard surface materials are not maintenance free. Care should be taken to match the intended hard surface material to the amount of maintenance expected for a particular installation.

Initial Clean-up and Protection - New Surfaces

This work is normally performed by the installer. It is important that surfaces be thoroughly cleaned after they are installed and grouted. Failure to perform a proper clean-up at this stage may result in a grout residue being left on the surface that may be very difficult or impossible to remove later. Usually glazed ceramic tile or tile with a high gloss surface is easier to clean. Tile that has an absorptive surface, slip resistant tile with abrasive aggregate in the surface or tile that has an embossed or textured surface may require a more detailed cleaning. In some cases, like polished porcelain tile, it may be necessary to seal the tile or apply grout releases prior to grouting to prevent pigment staining and ease grout cleanup. With high porosity material, it is better to apply some special sealer before the grouting. These sealers will make the grout cleaning easier and the removal of grout haze too.

In some cases, the floor installer will apply the initial application of sealer to the new surface. In other cases, this work will be performed by the owner's personnel or by outside maintenance professionals. Regardless of who performs the work, it is essential that the surface be clean and free of grout residue, dirt or other contaminants before sealers are applied. Newly installed surfaces should be protected by a suitable means to prevent damage or soiling by other trades until completed work is handed over to the owner.

Initial Post Construction Maintenance to Remove Surface Soil

1. This usually involves cleaning by vacuuming or sweeping with a push broom to remove dust and grit. This is normally done on a daily basis but the frequency of this procedure and other routine maintenance should be tailored to the requirements of the installation.
2. Always wash hard floor surfaces using clean water and a pH neutral (non-ionic) detergent used at the recommended dilution. Apply the cleaning solution evenly on the surface using a mop or spray application. Within five minutes, agitate the solution on the floor to free any attached soil using a 175-rpm rotary scrubber fitted with a fibre scrubbing brush or a nylon scrubbing pad. (Note: A natural fibre scrubbing brush will clean grout or textured surfaces better.) Pick up liquids from the scrubbed area using a wet vacuum. Rinse with clean water using the floor scrubber to agitate the rinse water followed by wet vacuum. Repeat this procedure and then allow to air dry.

IDENTIFICATION OF HARD SURFACES
TERRAZZO, TILE AND NATURAL STONE

TERRAZZO

Terrazzo is a floor or wall surface composed of a matrix binder along with a mixture of selected aggregates of marble, granite, glass or plastic, to which colour pigment may be added. The most common matrix binders are Portland cement, epoxy or polyacrylate. Each system exhibits particular characteristics. Certain matrices and aggregates, that have little or no absorption, may not require any special treatment after polishing. The owner would be well advised to verify the maintenance procedures with the manufacturer of the specialized matrix or aggregate.

Terrazzo floors require a sealer to prevent absorption. It is important that new terrazzo installations be sealed with a penetrating sealer to a clean dry surface. This should be done as soon as possible after the final grinding in order to prevent staining. New terrazzo floors should be cleaned only with a neutral (7.0+) ph. cleaner.

Proper care for the first year is very important and if properly treated, terrazzo will retain its beauty indefinitely. Special care in the cleaning of conductive terrazzo should be taken. Conductive floors must be kept free from harmful residues left by improper cleaners. Residues can create an insulating film that can destroy conductivity. Electric scrubbing and buffing machines aid in terrazzo care. Periodic scrubbing with an electric machine, using a solution of neutral liquid cleaner, loosens dirt that is sometimes hard to get off with daily wet mop cleaning. Buffing the terrazzo with the electric machine after each cleaning restores the beauty of terrazzo and continued buffing builds a natural sheen that becomes a permanent part of the terrazzo floor.

TILE

The following descriptions can be used to identify a particular tile.

Some types of tile have been classified in accordance with the CGSB National Standard CAN/CGSB75.1-M88 for ceramic floor and wall tile and trim units.

Ceramic Tile

Body of the tile is usually relatively thin and made from clay or a mixture of clay and other ceramic materials. May have either glazed or unglazed face. This terminology is a general description for all tile types and classifications.

Porcelain Tile

A ceramic tile that is generally made by the dust-pressed method from a composition that results in a tile that is dense, impervious and fi ne grained with a sharply formed face.

Quarry Tile

Glazed or unglazed tile made by the extrusion or dust pressed process from natural clay or shale, usually having 39 cm2 facial area.

Mexican Tile/Terracotta

This tile is generally hand-made and varies in colour, texture and appearance. The tile is available in various shapes and sizes. The tile may come pre-finished or require the application of various types of sealers or coatings on site to provide a wearing surface.

Terrazzo Tile

Pre-manufactured consisting of marble, granite, glass or other chips in a Portland cement or polymer matrix, available in various colours, thickness and sizes, prefinished or ground in place.

Agglomerate Tile

Agglomerate tiles are manufactured by mixing marble or granite chips of various sizes with Portland cement, polyester resin or epoxy. Thickness may vary from 6 mm to 20 mm and may be ordered in other thicknesses to meet specifications. Approximate water absorption, 24-hour immersion, 0.19% ASTM D570-81 modified but will vary from manufacturer to manufacturer.

MARBLE

Marble is a limestone that has crystallized naturally over a period of time. Marble is classified into four groups, Groups A, B, C and D. These are broad classifications and relate only to soundness and working qualities. However, for the purpose of this Maintenance Guide, marble has been classified as exterior or interior. The test used for water absorption is ASTM C97. Marble is cut into blocks, slabs or tile in various thickness and sizes. It is available in the following finishes; polished, honed, split face, abrasive and rough sawn. Marble is very sensitive to acids and alkalis and can be etched if spillage or splashes are not wiped up immediately. If marble is installed in an area where staining may cause problems, then the marble should be sealed. (Note: Impregnating/penetrating sealers are designed to prevent stains but do not stop acid etching of calcium based stones.)

TRAVERTINE

Travertine is a variety of limestone regarded as a product of chemical precipitation from hot springs that has been formed over a long period of time. The product is porous with many visible holes. It is available in colours ranging from ivory to golden brown. The holes and cavities may be filled with a matching Portland cement, coloured epoxy or polyester resins. Some travertine stone that take a polish are classified as marble according to ASTM C119.

GRANITE

Granite is a very hard crystalline, igneous rock that is available in a vast range of colour, texture and mineral composition. It is available in the following finishes; polished, honed, fine rubbed, thermal flame finished, and can take a sandblasted, coarse or fi ne stippled finish. ASTM C97 - Absorption by weight 0.4% max.

SLATE

Slate is a split stone and is one of the world's oldest natural products. It is available in the following finishes; honed, polished, sand rubbed, textured and natural cleft. Slate is available in various colours. Some shades will change colour on exterior use, therefore a non-fading shade should be specified for exterior applications. Water absorption of slate requirements shall be in accordance with ASTM C121.

LIMESTONE

Limestone is a sedimentary rock composed primarily of calcite or dolomite. It is available in the following finishes; polished, honed, rough textured, course, and stippled finish.

COEFFICIENT OF FRICTION/SLIP RESISTANCE (COF)

Coefficient of friction test method ASTM C1028-07 covers the measurement of static coefficient of friction of ceramic tile or other surfaces under both wet and dry conditions while utilizing a Neolite and leather heel assembly. Tile shall have factors of sliding friction of not less than 0.50 dry/0.60 wet for leather and 0.70 dry/0.65 wet for rubber. This requirement is in accordance with the Canadian General Standards Board CGSB-75.1-M88.

TILE CLASSIFICATION: CGSB STANDARDS CAN/CGSB-75.1-M88

Type 1 - Mosaic glazed
Classes - MR1 and MR2

Type 2 - Mosaic unglazed
Classes - MR1 and MR2

Type 3 - Facing Veneer
Classes - MR1, MR2 and MR3

Type 4 - Quarry tile
Classes - MR2 and MR3 and CR (ASTM C 650)

Type 5 - Wall tile (interior)
Class - MR4

Type 6 - Pavers
Classes - MR2, MR3 and CR (ASTM C 650)

Type 7 - Glazed Floor Tile
Classes - MR1, MR2, MR3 and MR4

CGSB 6.2 Water Absorption - When tested in accordance with ASTM C373, the tile shall show water absorption not greater than the values in Table 1, for the type of tile specified (MR= moisture resistance).

CGSB 6.15 Chemical Resistance - CR when specified tiles designated CR shall show no deleterious effect when tested according to ASTM C650.

TABLE 1
TILE & TRIM
Water Absorption, % By Mass

Type	CLASS	CLASS	CLASS	CLASS
	MR1*	MR2*	MR3*	MR4*
1	0 - 0.5	0.5 - 3.0	-	-
2	0 - 0.5	0.5 - 3.0	-	-
3	0 - 0.5	0.5 - 3.0	-	-
4	-	0.5 - 3.0	3.0 - 7.0	-
5	-	-	-	7.0 - 18.0
6	-	0.5 - 3.0	3.0 - 7.0	-
7	0 - 0.5	0.5 - 3.0	3.0 - 7.0	7.0 - 18.0

*MR1 and MR2 are considered to be resistant to frost.
NOTE: Porcelain tile shall be rated by the manufacturer as Type 1-MR1 classification to meet the water absorption standard in Table 1. As an example, Type 1-MR1 tile, water absorption shall not exceed 0.5%.

CERAMIC TILE CARE & MAINTENANCE

Introduction

Ceramic tile is one of the most durable and easiest to maintain surfaces you can choose for walls, floors, countertops, etc. With proper care and minimum maintenance, it will retain its original beauty and luster for many years. Generally, all that's necessary to keep the tile looking good as new is a quick wipe with a damp cloth or mop. Heavier cleaning may be required periodically to refresh the tile, or to clean tile that has been neglected. No special or unusual treatment should be required, and does not require waxing or polishing.

Post Installation Cleaning

- For cement based grouts – use an acid based cleaner (sulfamic, phosphoric, hydrochloric).
- For epoxy, urethane, pre-mixed acrylic grouts – consult with cleaning products manufacturer for appropriate cleaner.

NOTE: Acidic cleaners do not work on these grout residues.

- To facilitate ease of cleaning, a tiled surface must be free from all setting and grouting materials. Note that a haze may exist and not be readily apparent.
- For tile that are able to accept the treatment, an organic or sulfamic acid applied after installation will improve the overall performance of the product. Note: Organic or sulfamic acid used only when grout haze occurs; not as standard for all tile jobs.
- Wet the grout prior to applying an acid solution which is sufficiently strong to do the job but not burn the grout or surrounding fixtures. Always test an area first.
- Apply the solution to a small area, agitate and pick up the acid or move it to another area if not spent.
- Rinse the area well with clean water and remove excess water with a wet vac.
- Rinse a second time and pick up all traces of water.

NOTE: Do not let acid solution dry on tile as it will be very difficult to remove and could damage the product. Do not use acids stronger than those recommended. Acids are very dangerous to both those cleaning the tile and the environment. Once clean, protect the tiling from further construction dirt.

Routine Ceramic Tile Care

- Use only non-oil-based neutral cleaner, non-acidic, neutral PH cleaners.
- Wipe glazed wall tiles periodically using a cloth or sponge dampened with a non-oil-based household cleaner.
- Vacuum glazed floor tiles regularly to remove dirt and other gritty particles, then damp mop or sponge with an all-purpose, non-oil-based cleaner.
- Do not use ammonia, as it will discolor grout.
- Clean unglazed wall and floor tiles in a similar manner using a solution of water and a PH neutral detergent or a tile cleaner following manufacturers recommendations.

Grout Care

- Once the tile has been cleaned and dried (shortly after installation), grout joints should be treated with a penetrating sealer if required. Consult grout manufacturers recommendations.
- Epoxy grouts do not require a sealer.

Heavy Duty Cleaning

- Neglected or heavily trafficked tile may require more intensive cleaning.
- Clean glazed wall tiles with a scouring powder or all-purpose cleaner applied to a non-metallic pad.
- Rinse and wipe dry.
- For glazed floor tiles, use a commercial tile cleaner, or apply a strong solution of all-purpose, non-oil- based cleaner or scouring powder paste.
- Let stand for five minutes, brush and scrub.
- Then rinse with clean water and wipe dry.
- For heavy-duty cleaning of unglazed wall tiles, make a paste of scouring powder.
- Apply to surface and let stand for 5 minutes.
- Scour with brush, rinse and wipe dry.
- Unglazed floor tiles may be cleaned in the same way.
- Though a small brush is suitable for most floors, you may want to use a scrubbing machine for large areas.
- To clean badly soiled countertops, apply a solution of scouring powder and hot water.
- Let stand for five minutes, scrub with a stiff brush and rinse.
- Soap scum, mildew stains and hard-water deposits may be removed from the tile using appropriate cleaning products. Follow manufactures recommendations.
- Use all-purpose, non-oil- based cleaner.
- Allow to stand for 5 minutes before lightly scrubbing with a sponge.
- Rinse well.

Sourcing Maintenance Products

- Ceramic tile and natural stone cleaning products and sealers may be purchased at your tile/stone distributor, TTMAC member companies, home centres or floor covering stores.
- Consult the manufacturer of the cleaner, sealer or wax for usage instructions and more detailed information about how its specific cleaning solution or sealant may impact the safety, maintenance or appearance of your ceramic tile product.

Do

1. DO use a sealer on grout joints.
2. DO have any damaged or broken tiles removed and replaced only by a qualified contractor.
3. DO test scouring powders and other cleaners on a small area first.

Don't

1. DO NOT use cleansers containing acid or bleach for routine maintenance.
2. DO NOT use wax cleaners, oil-based detergents or sealants to maintain your tile.
3. DO NOT use ammonia (it will discolor grout).
4. DO NOT use harsh cleaning aids such as steel wool pads or scouring pads containing metal.
5. DO NOT use a cleaning agent that contains color on unglazed ceramic tile or natural stone.
6. DO NOT use an acidic based cleaner on marble, travertine, limestone or a cement tile.

Type of Tile/Usage	Routine Cleaning	Heavy-Duty Cleaning
Glazed tile walls, counter tops	Wipe with damp cloth or sponge using all-purpose cleaner. Use a light neutral cleaner for glossy surfaces. Wipe dry with cloth.	Clean with scouring powder, commercial tile cleaner or all-purpose cleaner using a non-metallic scouring pad. Rinse and wipe dry.
Glazed tile floor	Vacuum regularly to remove gritty particles.	Use a commercial tile cleaner or a strong solution of water and "soapless detergent." If stained, use scouring powder paste. Let stand five minutes, brush and scrub. Rinse and dry. For large areas and for areas that are difficult to clean, a power scrubber is recommended.
Glazed tile showers	Use all-purpose or bathroom cleaner. Allow to stand for five minutes, rinse and dry with towels. May also use neutral PH cleaners. No Acids.	Use chlorine bleach or hydrogen peroxide. For stubborn stains, use scouring powder containing a bleach agent. Let stand four to six hours, then scrub and rinse thoroughly. To remove mildew, use a commercial tile cleaner or chlorine bleach or ammonia. Do not mix chlorine bleach and ammonia.
Unglazed tile walls	Sponge with a diluted solution of water and "soap less detergent."	Use scouring powder paste. Let stand five minutes, then scour with brush. Rinse and wipe dry.
Unglazed tile floors	Vacuum regularly to remove gritty particles. Damp mop or sponge with water and/or a diluted solution of water and "soap less detergent."	Use scouring powder paste. Let stand five minutes, then scour with brush. Rinse and wipe dry. A small brush is suitable for small floors; consider a scrubbing machine for larger areas.

PORCELAIN TILE CARE & MAINTENANCE

Introduction

Porcelain stoneware is a technologically advanced material; porcelain tiles are composed of ultra-purified, highly ground clays with silica and feldspar additives. Porcelain tile is heated to extremely high temperatures, during which vitrification occurs, resulting in a surface of greater hardness than marble or granite. Porcelain stonewares' deep abrasion resistance, shock resistance, frost proof characteristics and exhibits the lowest water absorption rates and the greatest resistance to staining of any hard surface material.

Allow new installations of setting material to cure in accordance with manufacturer's instructions prior to treating the tile. Always test a small area to ensure desired results.

Post Installation Cleaning

- Post installation cleaning is the responsibility of the installer.
- Remove all construction debris from the area.
- Excess grout residues and factory applied protections must be removed from the surface of the tile immediately after the completion of the installation.
- Clean water and a cheese cloth are normally sufficient.
- If a light film of grout is still apparent, other acid solutions may be used. However, if not used correctly these solutions may weaken and deteriorate the grout joints.
- It is recommended to wait until the grout is fully cured before performing the acid wash.
- Surface should be cleaned with a sulfamic or mild organic based detergent and rinsed with clean water.

Note: Do not assume that because you cannot see the grout, it isn't there; a thin nearly invisible film may remain.

Regular Maintenance

- Sweep or vacuum the floor free of debris. If sweeping, use a soft natural bristle broom.
- Use the recommended amount of general purpose neutralizing cleaner to clean the surface.
- Rinse with clean water or a mild solution of neutral cleaner, suspend and remove all soft residues.
- Remove excess water.

Maintenance for Extremely Dirty Areas

- Sweep or vacuum the floor free of debris
- Scrub with a high PH or alkaline cleaning compound and floor machine equipment with an abrasive pad or natural bristle brush.
- Pick up soiled cleaning solution with a wet vacuum.
- Rinse floor area twice with clean water.
- Remove excess with a wet vacuum.
- If the dirt is not organic, it's better to use a bit of PH 3 cleaner, after that rinse and neutralize it with PH 12.

Maintenance for Textured Surfaces

NOTE: Textured surfaces, although it offers excellent safety features (e.g.: increased co-efficient of friction) require additional maintenance. Due to the crevices on the tile surface, it will be necessary to reach the soil that rests in the low points. Standard wet mopping will not be completely effective in maintaining these surfaces.

- Sweep and vacuum floor debris ensuring that all soil is removed completely.
- Use a scrubbing machine or mop with a mild cleaning solution, using cross action to ensure that all dirt is removed.
- Rinse several times with clean water.
- Proper cleaning enhances the aesthetic characteristics of any floor.

Sealing Maintenance

To be executed only after consultation with the porcelain tile supplier. Many porcelain tiles do not require application of any sealer. Surface treatments will depend on the porosity, density, hardness, foot traffic and the elements the area is exposed to. The user must determine the suitability of the finishing product for the intended use.

PORCELAIN TILE TESTING

Type of Tile/Usage	Method of Test	Requirements
Water Absorption	ASTM C373.88	Impervious (.05% or Less) Vitreous (.05% - 3%) Semi Vitreous (3.0% - 7%) *When tested as described in ASTM C373 tile shall be impervious for porcelain paver tile and shall not exceed.5% for natural clay paver tile.
Abrasive Wear	ASTM C501-84	The porcelain tile in the sample shall have an abrasive hardness index of 100 or greater and the natural clay-type paver tile an index of 50 or greater.
Co-efficient Friction (Neolite) Dry Wet	ASTM C1028-07	The Ceramic Tile Institute identifies tile in the following 3 categories: Slip Resistant (0.60 or Greater) Conditionally Slip Resistant (0.50 - 0.60) Questionable (Less than 0.05)
Breaking Strength	ASTM C648.84	As described in ASTM 648, the average breaking strength shall be 250 pounds or greater.
Stain Resistance • Coca Cola • Lemon Juice • Bacon Grease • Mustard • Ketchup • Wesson Oil	CTI-T-72	Stain materials are applied to the surface of the tile with one area covered and a second area uncovered. The stain mineral is in contact with the floor for 24 hours, then cleaned with Ajax cleanser and water.
Chemical Resistance 10.0% HCL 10.0% KOH	ASTM C650	Exposure time of 24 hours at room temperature of 75.7F / 21C
Thermal Shock	ASTM C484	ANSI 138.7-88 (par 6.4.1.3.3) the body shall show no evidence of disintegration.
Freeze Thaw Cycle	ASTM C1026.84	Unaffected: No crazing, chipping, spalling, body checks or cracks
Flatness of tile Major Minor	ASTM C499	The range of average thickness of the tile in the sample shall not exceed 0.040 inch.
Wedging	ASTM C502	The wedging of each tile in the samples shall not exceed 1.0%.
Facial Dimension Maximum Minimum Facial Range	ASTM C499	The average facial dimensions of each tile in the sample shall not vary more than 3.0% from the nominal dimension. The ranges of average facial dimension shall not exceed 1.5% of the largest value of the range.
Warpage Maximum (Length) Maximum (Width) Maximum (Diagonal)	ASTM C485	The average warpage of each tile in the sample shall not exceed 1.0% along any edge, nor .075% on either diagonal.
Bond Strength	ASTM C482	The average bond strength of the tile in the sample shall be 50 PSI or greater.

GLASS TILE CLEANING & MAINTENANCE

Post Installation

- Do not attempt to clean new installations for a minimum of 24 hours after completing the grouting process. After 24 hours remove loose dirt by vacuuming or sweeping.
- Follow directions and prepare a cleaning solution using warm water and a neutral ph. cleaner. These types of cleaners are available from tile suppliers.
- Thoroughly clean the glass tile, including the grout joints, using a nylon scrub brush or nylon scrub pad following manufacturer's directions.
- Rinse thoroughly with clean, warm water and allow to dry. A second rinsing may be required to completely remove all traces of the cleaning solution.
- Cleaning glass tile is easier with microfiber cloth. Microfiber will collect the dirt and will release it only when you squeeze it with water.

Regular Maintenance

- Prepare a cleaning solution using warm water and a neutral ph. cleaner specifically designed for cleaning glass tile. These types of cleaners are available from tile suppliers.
- Thoroughly clean the glass tile, including the grout joints, using a nylon scrub brush or nylon scrub pad following the manufacturer's directions.
- Rinse thoroughly with clean, warm water and allow glass tiles to dry.
- A second rinsing may be needed to completely remove the cleaning solution.
- Cleaning glass tile is easier with microfiber cloth. Microfiber will collect the dirt and will release it only when you squeeze it with water.

Heavy Duty Maintenance

- Grout must be cured for a minimum of 14 days.
- The following method of maintenance should be used for installations with cement based grout or setting material haze that require a stronger cleaning solution.
- Wait 14 days after the grout has been installed then use a sulfamic acid or organic based cleaner.
- Follow the manufacturer's directions using a nylon scrub brush or nylon scrub pad.
- Apply the solution allowing it to penetrate for 3-5 minutes followed by re-applying and scrubbing.
- Rinse thoroughly with clean, warm water and allow to dry. A second rinsing may be needed to completely remove the cleaning solution.

Additional Cleaning Instructions for Glass Tile with Latex Based Smears

- Use of stone and tile strippers may be required.
- The stripper will work to clean latex smears not removed by using acid based cleaners.
- Allow a minimum of 14 days' cure time and always follow the manufacturer's directions.
- Rinse thoroughly with clean, warm water and allow to dry. A second rinsing may be needed to completely remove the cleaning solution.

Sealing

- Sealers can be beneficial for grouts if recommended. Grout will not penetrate the tile due to the impervious nature of glass.

NOTE: Crackle glaze tile can be protected with a solvent based penetrating sealer.

- Consult grout manufacturers for their recommendations.
- To reduce the possibility of sealer smears, buff sealer off glass tile with dry, clean towels before it dries.
- Always test a product in an inconspicuous area before treating the entire tile installation.
- When using recommended products for tiled areas, protect surrounding non-tiled surfaces.
- Tile cleaning and maintenance products can adversely affect metals and wood.
- When using acid cleaning products always follow proper procedures and use personal protection equipment.

CAST METAL TILE MAINTENANCE

Routine Care

- The surface can be cleaned with any neutral PH cleaner.
- For best results, use a liquid non-abrasive cleaner.
- Powdered or abrasive cleaners should be tested in a small inconspicuous area to ensure damage will not result.
- Do not clean with scouring pads, steel wool, sandpaper or other abrasive implements.

DO

- Always clean tile with a damp sponge mop, using a small amount of soapless detergent in warm water.
- Ensure cleaner is a PH neutral - non-acidic and non-alkaline.
- Where soil is more concentrated, use a cleaner made specifically for tile.

DON'T

- DO NOT use soap on tile. Soap leaves a film that dulls the surface and promotes mildew.
- DO NOT use an acid or ammonia-based cleaner, as it could affect the colour of the grout. Acid-based cleaners will cause polished marble tiles to dull. You should NOT use bleach or vinegar and water - vinegar is an acid.
- DO NOT use steel wool pads or any abrasive on tile. These materials can scratch or dull the surface. Also, any loose particles of steel left on the grout will cause rust stains.

NOTE: For complete details on protecting, cleaning and solving problems with these surfaces please contact the supplier of the material.

NATURAL STONE CARE AND MAINTENANCE

Note: The first step in stone tile maintenance is the sealing of the stone. Generally, all stone must be sealed. Follow the manufacturer's recommendations for the product chosen.

Knowing the surface type (polished, honed, or natural) coupled with the density and porosity of the stone will determine the best type (petroleum or water based) of sealer to be used.

Regular Maintenance

- Immediately wipe up spills and messes. Use pH neutral cleaners and soapless detergents for daily cleaning.
- Rinse the stone and grout thoroughly to remove any remaining cleaner.
- Agitate grout joints with a soft bristled brush to loosen debris.
- Thoroughly rinse, dry, and polish cleaned areas.
- Acidic cleaners will etch and remove the polished surfaces from calcium based stones such as marble, travertine, and limestone. Make sure you read carefully the label of the cleaner. Sometimes acid ingredients are hidden behind the world "natural"
- Acidic cleaners will eventually erode the grout in the joints making cleaning and maintenance more problematic. This is especially true if using acid cleaners on sanded grout installations.
- Colored grout pigment can be permanently damaged by using acidic cleaners. This is especially true if acidic cleaners are used on a daily basis.

Heavy Duty Maintenance

Heavy duty cleaning requires the use of pH alkaline based cleaners and hot water. These can include scouring cleaners and poultices manufactured for this purpose. Use a soft bristled brush to agitate the cleaners in the grout joints.

- Test an inconspicuous area with any abrasive powder to evaluate if it will adversely affect the finish of the stone.
- Allow the cleaner to rest upon the surface to gain the full potential of the cleaner.
- If these results are not acceptable, then proceed to the more aggressive high alkaline "heavy duty" or "deep clean" type cleaners available from reputable Manufacturers.
- Commercial floor buffers or cleaning machines are perfectly suited to clean large areas. The biggest question here is the selection of the cleaning solution.
- It is very important to rinse the tile and grout thoroughly to remove any remaining cleaner.
- If the results are not satisfactory using high PH alkaline cleaners, it may be necessary to use an acidic solution to solve a particular problem.
- Acidic cleaners will etch and remove the polished surfaces from calcium stones like marble, travertine, and limestone.
- Sulfamic and phosphoric acids are the safest and most used acids in solving cleaning problems. These two acids have very specific mixing and application recommendations must be followed correctly.
- Always, thoroughly rinse the cleaned area, dry, and polish.

Other Maintenance Information for Natural Stone

- Most stones, once protected, require occasional scrubbing to remove surface build-up of dirt and grime.
- Using a neutral cleaner, apply cleaner as directed, rinse using clean water.
- Towel drying after rinsing removes streaks especially on polished surfaces.
- On some types of stone, you can apply coatings to produce a "wear layer" or "sacrificial coating" but this may change the look of the stone and may sometimes require more maintenance to maintain the beauty of the floor.
- On honed (smooth but not polished) or slate (rough) finish stones, a good scrubbing is required more often, due to the texture of the product holding the dirt to the surface.
- A good penetrating sealer cuts down on the frequency of this task.
- Most stones will be easy enough to maintain with a high-quality sealer and regular maintenance.
- With all stones, establish what sealer to use or has been used previously, and then work within the manufacturer's guidelines to set up a regular maintenance schedule.

Stain Removal

- For stains on marble or stone, a product commonly referred to as "poultice" should be used.
- Poultice is used in a paste form and is applied to the surface, covering the entire area where the stain is located.
- Then apply a piece of plastic, larger than the stain area, over the poultice and seal off with painter tape.
- Allow it to set the prescribed amount of time by the manufacturer and remove plastic.
- The stain is normally drawn out of the stone.
- Some poultice type products push the stain down into the stone away from the surface of the stone and allow you to seal the stone, thus keeping the stain away from the surface. Follow manufacturer's directions and recommendations.
- Some stains may require multiple applications or can only be partially removed.

Repair of Marble

- Polishing stones to make attractive edges or to fi x damage done by chemicals can be done in small areas.
- Kits are available that have all the products to do this in one box.
- If you have a large area that is damaged or if you want to establish a once-a-year regular maintenance procedure to keep your marble glowing with the original luster finish, contact a company that specializes in this type of work.
- In cases where the marble surface is badly scratched, worn, or needs major work, professional refinishers may be the answer.

Natural stone products are porous by nature. To ensure your natural stone products will provide you with a lifetime of aesthetics and performance, proper maintenance is crucial.

New Installation

Sealing is strongly recommended for newly installed marble and other natural stone to provide maximum surface and below surface protection.

Pre-Grouting Sealing

Non-Sanded grout is typically used for a natural stone installation. This type of grout has very fi ne particles of cement, polymers, and color pigments that can penetrate the microscopic pores of the stone surface where they become trapped and appear as a stain in the stone. Therefore, travertine, slate, tumbled stone, and honed/flamed/unpolished granite should be sealed prior to the grouting process to protect stain from penetrating where appropriate. A grout releasing sealer can be used for this application. A good quality sealer can also be used as a pre-grout sealer and applied again as the final sealing process once the installation is finished.

Sealing Natural Stone

Sealers used for natural stone are either designed to penetrate below the surface (penetrating sealers/impregnators) or coating-type sealers designed to affix a protective coating over the stone surface. Penetrating/impregnator sealers can generally be used on all natural stone surfaces whereas coating-type sealers are normally designed for rough textured surfaces such as slate and sandstone. Also, note the limitations of topical sealers – do not allow vapor transmission, not for exteriors/wet areas. It makes the surface slippery.

The type of stone and the environment of the application must determine the type of treatment that is applied to the surface of the stone. All surface treatments must be used in accordance with manufacturer's specifications. Surface treatments (topical and penetrating agents) may be used when a defined benefit can be determined. Benefits from the use of surface treatments may be considered for use when:

1. The risk of staining is present.
2. As an aid in daily maintenance procedures.
3. A coating may help preserve the stone finish in excessively high wear conditions.
4. Where weathering has, or might impact the integrity of the stone surface.
5. To preserve the aesthetic elegance of the original installation.
6. Where the risk of graffiti or other vandalism is high.

Natural Look Penetrating Sealer
A premium natural look penetrating/impregnating sealer is the normal choice on polished or honed marble, limestone, granite and slate. Penetrating/impregnating stone sealers are non-sheen, natural look sealer that can be water-based or solvent-based, good for interior and exterior applications. The natural look penetrating sealer is not a surface coating and will not alter the natural look of the stone.

Stone Enhancer Sealers
Stone enhancer sealers are non-sheen, penetrating/impregnator sealers that are formulated to darken, enrich, and highlight the natural color of tumbled, antique, or slate products. They will rejuvenate and improve the appearance of worn and weathered stone. However, they will also darken the color of grout joints.

Stone Care
Use cleaners specifically designed for cleaning stone. Stone cleaners should never contain acid or bleach. Acids, even a light solution of vinegar and water, will etch and eventually damage calcium based natural stone such as marble, limestone and travertine.

Stain Removal
Stains can often be removed by cleaning with an appropriate cleaning product or household chemical. Identifying the type of stain is the key to removing it. Look for color, shape and environmental factors that could be causing the staining. Always do a test area first.

TYPES OF STAINS & FIRST STEP CLEANING ACTIONS

Oil Based: Include grease, tar, cooking oil, milk and cosmetics. An oil based stain will darken the stone and normally must be chemically dissolved so the source of the stain can be flushed or rinsed away. Blot first and then clean gently with a high PH cleaner, soft liquid cleanser or household detergent or ammonia or mineral spirits or acetone.

Organic: Includes coffee, tea, fruit, tobacco, paper, food, urine, leaves, bark and bird droppings. May cause a pinkish brown stain and may disappear after the source of the stain has been removed. Outdoors, with the sources removed, normal sun and rain action will generally bleach out the stains. Indoors, clean with a 12% hydrogen peroxide and a few drops of ammonia.

Metal: Includes iron, rust, copper and bronze. Iron or rust stains are orange to brown in color and follow the shape of the staining objects such as nails, bolts, screws, cans, flower pots, and metal furniture. Copper and bronze stains appear as green or muddy brown and result from the action of moisture on nearby or embedded bronze, copper or brass items. Metal stains must be removed by making a poultice. Deep seated, rusty stains are extremely difficult to remove and the stone may be permanently stained.

Biological: Includes algae, mildew, lichens, moss and fungi. Clean, dilute with 1.2 cup in a gallon of water with only one of the following: ammonia, bleach, or hydrogen peroxide. DO NOT MIX BLEACH AND AMMONIA! THIS COMBINATION CREATES A LETHAL AND TOXIC GAS!

Ink: Includes magic marker, pen and ink. Clean with bleach or hydrogen peroxide for light colored stones. Lacquer thinner or acetone may be used for dark colored stones. However, caution should be taken as these products are highly flammable.

Paint: Small amounts can be removed with lacquer thinner or scraped off carefully with a razor blade. Heavy paint coverage should be removed with a commercial "heavy liquid" stripper. Paint strippers can etch the surface of the stone; re-polishing may be necessary. Do not use acids or flame tools to strip paint from the stone.

Water: Water spots and rings that include surface accumulation of hard water. Buff with dry 0000 steel wool or light abrasive cleaner, testing first to ensure desired results.

Fire and Smoke Damage:
Older stones and smoke or fi re-stained fi replaces may require a thorough cleaning to restore their original appearance. Commercially available "smoke removers" may save time and effort.

Etch Marks: Usually caused by acids left on an acid sensitive stone. Some materials will etch the finish but not leave a stain; others will both etch and stain. Once the stain has been removed, wet the surface with clean water and sprinkle with marble polishing powder or compound. Rub into the stone with a damp cloth or by using a buffing pad with a low-speed power drill. Continue buffing until the etch mark disappears and the stone surface shines. Honing may be required for deep etching.

Efflorescence: Is defined as a white powder that may appear on the surface of the stone. It is caused by water carrying mineral salts from below the surface of the stone rising through the stone and evaporating. When the water evaporates, it leaves the powdery substance. If the installation is new, soft brush, dust mop or vacuum powder. Repeat as necessary as the stone dries out. Do not use water to remove the powder. If the problem persists, contact the contractor to identify and remove the cause of the moisture.

POULTICE
A stone poultice is designed to remove most stains and light grout haze from the stone. Poultice is a fi ne, non-acid, absorptive clay cleaning powder that removes deep-set oil stains, grease and light cementitious grout haze from polished and unpolished natural stone. A poultice is a liquid cleaner or chemical mixed with an absorbent material to form a paste with a thick, creamy consistency. The poultice is spread over the stained area to a thickness of 6 mm to 12 mm with a wood or plastic spatula or scraper, covered with plastic and left to work for 24 to 48 hours. The liquid cleaner or chemical will draw out the stain into the absorbent material. Poultice procedures may be repeated to thoroughly remove a stain, but some stains may never be completely removed.

Poultice materials include kaolin, fuller's earth, whiting, diatomaceous earth, powdered chalk, white molding plaster or talc. Approximately one pound of prepared poultice material will cover one square foot (30cm). Do not use whiting or iron type clays as fuller's earth with acid chemicals. The reaction will cancel the effect of the poultice. A poultice can also be prepared using white cotton balls, white paper towels or gauge pads. Pre-mixed poultices that require only adding water are also available from stone maintenance supply companies.

Poultice Additives for Removing Stains
Oil Based Stains: Poultice with baking soda and water OR one of the powder based poultice materials and mineral spirits or an alkaline cleaner.

Organic Stains: Hydrogen peroxide solution OR use acetone instead of hydrogen peroxide.
Iron Stains: Light acidic cleaner. Rust stains are particularly difficult to remove. Professional assistance may be required.

Copper Stains: Ammonia. These stains are difficult to remove. Professional assistance may be required.

Biological Stains: Diluted ammonia OR bleach OR hydrogen peroxide. DO NOT MIX AMMONIA AND BLEACH! THIS COMBINATION CREATES A TOXIC AND LETHAL GAS!

Application of Poultice
Prepare the poultice. If using powder, mix with the cleaning agent or chemical to a paste with a thick creamy consistency. If using paper, soak the chemical and let drain. Do not let the liquid drip. Wet the stained area with distilled water. Apply the poultice to the stained area, approximately ¼" (6mm) to ½" (12mm) thick and extend the poultice beyond the stained area by approximately 1" (2.5cm). Use a wood or plastic scraper to spread the poultice evenly. Cover the poultice with plastic and seal the edges with blue painter's tape. Allow to dry thoroughly, usually 24 to 48 hours. The drying process pulls the stain out of the stone and onto the poultice material. After approximately 24 hours, remove the plastic and allow the poultice to dry.

Remove the poultice from the stain, rinse with distilled water and buff dry with a soft cloth. Use a wood or plastic scraper if necessary.

Repeat the poultice application if the stain is not removed. It may take up to five (5) applications for difficult stains.

If the surface is etched by the chemical, apply polishing powder and buff with a polishing pad recommended by the polishing powder manufacturer.

RESTORATION OF NATURAL STONE

If the floor surface has holes or cracks, this area must be repaired and color matched prior to the grinding process using epoxy or polyester compounds or a cement acrylic paste whichever is appropriate for the surface involved. All lippage must be removed by use of specific grinding. If lippage is not removed, excessive wear and damage to the various diamonds or abrasives may result. Wet grind the floor beginning with coarser abrasives, progressing to finer abrasives until the desired degree of finish is obtained. Prior to moving on to the next level of grinding, the entire floor must exhibit a uniform scratch pattern. Higher grades of diamonds or abrasives may be necessary due to the hardness of the stone. According to ASTM C97 if the average absorption rate of granite is 0.4% the moisture will temporarily affect the appearance of the granite causing it to "darken". This effect disappears upon the return to dry conditions. As grinding progresses the slurry produced must be removed by using a wet vacuum. Before moving from one abrasive grind to a finer grind, thoroughly wash the surface to remove any residue from the previous grind or scoring will result in the next level of grinding. After completion of the final grind, wash and rinse the floor and seal.

NOTE: Instructions for restoration and maintenance of agglomerate should be obtained from the manufacturer. Polyester filling compound is used to fill larger holes, cracks and voids. Repair kits are available from the manufacturer.

POLISHING OF MARBLE FLOORS

This process is an alternative to a full restoration procedure to bring back and to maintain a high degree of shine to worn traffic areas. This can be achieved with polishing powders or compounds (Aluminum Oxide, Tin Oxide). These powders are usually white, but can be yellow, brown, gray or black. The abrasive powder or compound is worked into the stone with a 175-rpm buffing machine using water and cloth or polyester fibre pads. The powder or compound is worked into a slurry until the desired degree of shine is achieved. Remove slurry from surface with a wet pick-up vacuum or wet mop. Rinse with clean water to remove any excess powder or compound left on floor. Caution should be used. Some marble may polish with a very wet consistency while others may require almost buffing. Test the ratio of powder to water for suitability. Care must be taken as most polishing powders contain oxalic acid and if over used, damage to the marble will occur. If not enough is used the polish may not be achieved. This type of work requires experience and should only be performed by professionals who are specialized in the use of these materials and equipment. Manufacturer's instructions must be followed. On the market are there are new diamond pads to restore marble floor. These pads are an alternative process to the diamonds for the maintenance. These pads start from 50 grit up to 5000 grit. The main difference is that they don't need a lot of water and they don't leave marks on the surfaces. They do not require any chemicals in daily cleaning to keep the floors clean and shiny. For floors that require floor finish, they will reduce the frequency of the periodic maintenance.

CRYSTALLIZATION/VITRIFICATION OF MARBLE

These terms, although technically incorrect, have generally been used to describe a process for polishing marble by applying chemicals that react with the marble while buffing the marble surface. The chemicals used may be oxalic acid, silicon fluorides or other proprietary materials.

Crystallization chemically alters the surface of the marble and leaves a harder less permeable surface. Crystallization appears to work well in some marble and under certain service conditions. However certain types of marble may be deteriorated by the chemicals used in crystallization. Generally, marble used on floors should not be finished to a very high gloss but should be given a honed finish and treated with impregnators to improve resistance to staining. A high gloss finish on marble floors may be appropriate for light commercial and residential traffic conditions. Where a high gloss finish is desired, it may be obtained by the use of crystallization or by the application of suitable polishes. Altering the floor surface to a high gloss may affect the slip resistance. Damaged or worn floors can be reground and polished to their original luster and appearance by the use of diamond discs and special equipment prior to crystallization. Crystallization is only possible on marble and limestone. Granite cannot be crystallized.

WARNING: Because crystallization/vitrification uses chemicals and components that transform the surface of marble and stone, there is controversy regarding this method of restoration. This procedure should be used at the discretion of the client. Trained craftsmen who are thoroughly familiar with this process should only carry out this work.

TERRAZZO MAINTENANCE

Introduction

All terrazzo flooring requires regular maintenance to ensure good looks and long service. It is normal for floor coatings to become worn out and defaced by abrasion. Dust is an abrasive to floor coatings and it is imperative to remove it to reduce abrasion. Regular washing and wax lubricates the floor against abrasion. Waxing is recommended but not a requirement.

Types of Terrazzo Systems

There are three type of binders used to anchor aggregate chips to a terrazzo floor.

1. Portland cement product.
2. Polyacrylic modified Portland cement which includes an acrylic additive.
3. Epoxy or polyester system, often referred to as a resinous thin-set terrazzo floor system.

The treatment and maintenance of these different systems do vary. Terrazzo floors are very easy to maintain; however, this does not mean that CARE IS NOT REQUIRED. Understanding the care requirements of a new terrazzo floor from the beginning, will prevent possible problems, and recognize the economy of care and the aesthetic values of Terrazzo.

Portland Cement System

- The surface of this terrazzo floor has a minimum 70% density aggregate chip surface exposure.
- Most aggregates have a low porosity of absorption.
- The Portland cement binder which has 30% or less surface exposure needs protection.
- Requires a penetrating type sealer applied to the surface following the final polishing. To help inhibit the penetration of spilled materials into the terrazzo floor.
- Spills must be cleaned up immediately in order to prevent staining from long term exposure.
- Penetrating sealers do not produce a high gloss sheen to the floor surface.
- The owner should apply finish coats to achieve the desired surface finish.

Resinous Types of Terrazzo Systems (Epoxy and Polyester)

No penetrating type sealer is required for this type of terrazzo floor since the binder or matrix is a non-porous material. Only surface sealers should be used as mentioned in the contents of these instructions.

Normal Maintenance of Terrazzo

- Harsh cleaners and sealers may damage terrazzo; therefore, only use approved materials that are neutral with a PH Factor between 7 and 10 when scrubbing or mopping terrazzo floors.
- Cleaners or soaps containing water soluble, inorganic or crystallizing salts or acids should not be used.
- Sweeping compounds containing oil which may also be a fi re hazard may penetrate the terrazzo and could permanently discolor and stain the surface.
- Many of these compounds contain sand or a course substance which is hard to sweep and can abrade the surface if not completely removed.
- Most owners prefer a high sheen on their floors.
- Since safety is always a concern, use water based sealers in the acrylic family especially designed for Terrazzo use which should provide a coefficient of friction rating of minimum of 0.5.
- Solvent based sealers have a tendency to discolour with age and are difficult to remove especially when wear patterns develop or discoloration requires stripping of the surface.
- Acrylic water based sealers/finishes are recommended to be applied in one or more coats, in accordance with the manufacturer's instructions.
- This can also be followed by an acrylic water-based finish for daily or weekly buffing if a high sheen is desired.

General Cleaning Procedures

- Neutral cleaners are designed to react only in a solution with clean water and mixed in accordance to the manufacturer's instructions.
- This mixed solution must be allowed to remain on the floor surface for several minutes.
- Allow sufficient time for the dirt and grime dissolving action to properly work.
- Rinse the dirt-laden solution from the surface with a squeegee, wet vacuum or by mopping.
- Rinse the area with plenty of clean warm water.
- It is very important to keep the surface of the terrazzo floor wet during this entire cleaning process so the dirt does not reabsorb into the floor.
- The amount of traffic will determine how often you must sweep or scrub your terrazzo floor daily.
- It is normal that daily dust mopping is required in most public buildings.
- Grit will act as an abrasive on the terrazzo surface.

Routine Maintenance

Maintenance frequency will be determined by the volume and type of traffic. The following recommendation should be used as a guide to establish a suitable maintenance program and are minimum maintenance suggestions to keep a terrazzo floor clean and long lasting.

CAUTION: Before deviation from any terrazzo maintenance instructions, contact your terrazzo contractor for advice. ALWAYS KEEP RINSE WATER, MOPS AND PAILS CLEAN.

Daily Maintenance

- Sweep and dust mop daily.
- Hand work stubborn stains and scuff marks with a neutral cleaner diluted in warm clean water.

Weekly Maintenance

- Damp mop lightly soiled floors with clean warm water and a neutral cleaner.
- Heavily soiled floors must be scrubbed with a mechanical buffing machine and a neutral cleaner.
- Rinse and mop up residue with clean warm water before it dries.
- Allow to completely dry before machine buffing using proper buffing pads or brushes.

NOTE: Once you apply the neutral cleaning solution to the terrazzo floor, allow sufficient time to react. This type of cleaner is designed to loosen foreign matters from the surface of the terrazzo floor. Do NOT allow this solution to dry on the surface.

WARNING: ANY SEALER OR SURFACE DRESSING MUST BE TESTED AND APPROVED FOR SLIP RESISTANCE.

Some Additional Options to the Above Include the Following:

- Apply high luster finishes over sealer to the desired sheen. Normally, surface finishes require the added expense of spray buffing to maintain the high sheen. Terrazzo, unlike other flooring products, does NOT require surface finishes for wear protection.
- Some owners have been testing new technologies from the marble and granite industry to produce super high gloss finishes without day to day recoating.
- These include a series of diamond pads on mechanical devices which produce a polishing as well as crystallization/ vitrification effect. At this time, the TTMAC does not endorse this system.

NOTE: In the event the terrazzo floor becomes heavily soiled, consult with your local terrazzo contractor or the TTMAC for direction before using any cleaners or strippers. Ignoring this warning could prove harmful to your terrazzo surface.

TIPS FOR TERRAZZO MAINTENANCE

Terrazzo floors are ground, polished and sealed with a penetrating terrazzo sealer. This procedure and application protects your terrazzo surface from immediate stains however SPILLAGE should NOT be ignored and allowed to soak and dry into the floor. Good housekeeping procedures require that the terrazzo floor remains clean and dry at all times.

TERRAZZO FLOOR CARE

1. DO ask the installing terrazzo contractor to recommend the proper neutral cleaners and sealers to be used on the floor.
2. DO dust terrazzo floors daily. This not only picks up the dust, but also the fi ne grit tracked into the building. Grit acts as an abrasive on the surface of your floor.
3. DO scrub floors a minimum of twice a week, where a NEW terrazzo floor has been installed for the initial two or three months. Construction dust may still be in the air and will be deposited on the floor. After this period, once per week or whatever is necessary to keep the floor clean based on the amount of foot traffic. Always rinse floors well to prevent a build-up of cleaner residue which may become slippery.
4. DO apply a water based acrylic sealer in accordance with the manufacturer's instructions. Normally, a new terrazzo floor requires two or more coats, which provides a good sheen for a period of 45 to 60 days before needing additional coats depending on foot traffic. Special attention should be considered for slip resistance with a rating of a minimum of 0.5.
5. DO use only maintenance products designed for the specific type of terrazzo installed.
6. DO allow a neutral cleaner, once applied to the terrazzo surface, sufficient time to react as designed to loosen foreign matters. Several minutes should be adequate, but DO NOT allow this solution to dry on the surface.

1. DO NOT use pure surface waxes or all-purpose sealers. These products may result in slippery floors.
2. DO NOT use all-purpose cleaners containing water soluble inorganic or crystallizing salts, harmful alkali or acids. The use of these products may be harmful to the terrazzo floor.
3. DO NOT use cheap cleaners or surface finishes since the majority of your maintenance costs are labor.
4. DO NOT try "miracle" cleaners or surface finishes on terrazzo floors without inquiring about these products with a terrazzo contractor or the TTMAC.
5. DO NOT use solvent cleaners on resinous terrazzo.

SURFACE RESTORATION OF TERRAZZO

Restoration requires remedial action that should only be performed by professionals who are specialized in the use of specific equipment and materials according to trade practice.

Stripping

Remove existing floor finishes with a heavy duty commercial floor stripper designed for the use on terrazzo as per manufacturer's recommendations. Apply solution with a clean mop. Machine scrub with a brush or pad. Remove dirty solution with a wet vacuum or mop. Rinse with clean water and allow terrazzo to dry thoroughly. Apply an appropriate terrazzo sealer as per manufacturer's recommendations. This same basic procedure applies to the terrazzo base using scrubbing equipment for vertical applications. New 50 grit diamond pads can strip the terrazzo floor without using any stripper and leave a consistent surface ready for the other process.

Light Re-grinding

This procedure is suggested to refinish terrazzo floors and bases where a light grinding is required. Using a terrazzo floor machine, grind with number 80 grit stones or diamonds. Keep the area wet with clean water at all times. Fine silica sand may be used if surface finishes and dirt are difficult to remove. Remove grinding slurry thoroughly and rinse with clean water. If required, regrind the entire surface with number 120 grit abrasive stones or diamonds keeping the floor wet. Wash and rinse well with clean water. The same procedure applies to refinishing the terrazzo base, using base grinding machines and appropriate grinding stones or sanding discs. Allow areas to dry thoroughly and apply a terrazzo sealer as per manufacturer's recommendations.

Heavy Re-grinding

This procedure is required to remove multi layers of surface finishes (sealers, waxes), dirt and to grind a thin layer of terrazzo which may remove superficial stains, scratches and badly pitted surfaces. With a terrazzo floor grinding machine, remove a thin layer of terrazzo using course stones or diamonds such as 24 grit. When completed, remove all slurry and rinse with clean water. Further grind the terrazzo with number 80/120 grit stones or diamonds, keeping the floor wet until the terrazzo is free from scratches. Remove all grinding slurry and thoroughly wash and rinse surface. If terrazzo is a cementitious base, grout using a cement/acrylic mix with or without colour pigment added to match the terrazzo matrix, filling pinholes and voids. If terrazzo is an epoxy resin type, allow surface to dry thoroughly, then grout using a coloured epoxy resin to match the terrazzo matrix, filling pinholes and voids. Allow grout to remain on the surface until completely cured. Wet grind with 80 or finer grit stones or diamonds until all grout has been removed from the terrazzo surface. Wash and rinse terrazzo using a neutral cleaner and allow terrazzo to dry thoroughly. Apply appropriate terrazzo sealer following manufacturer's directions.

The same basic procedure applies to resurfacing a terrazzo base, using base machine grinders and appropriate grinding stones or sanding discs.

Patching Terrazzo

Remove any loose and unsound materials and clean thoroughly. Use an appropriate bonding agent, epoxy or cementitious binding materials and an aggregate mixture to match existing terrazzo. After curing, grind patches using 80 grit or finer stones until area has a similar finish to the surrounding floor. Allow area to dry, then apply the appropriate terrazzo sealer as per manufacturers recommendations.

Terrazzo repairs or patches may not match the original installation. Factors such as binding materials, variations in aggregate, discolouration over time, exposure to the elements and normal wear and tear may play a role in matching the existing terrazzo.

EFFLORESCENCE

Efflorescence occurs when solutions of alkalis or salts move through a porous material to the surface and as the water evaporates, a white powdery crust is formed at the surface exposed to air. Usually the main component in efflorescence that occurs is lime or other soluble alkalis, which are naturally present in Portland cement, but other soluble salts may also be involved. Efflorescence when it first appears can be removed by washing with water but soluble alkalis will react with carbon dioxide in the atmosphere forming carbonates, which are insoluble in water. Removal then requires washing with a solution of sulfamic, phosphoric or organic acid which reacts to produce soluble salts and liberate CO2. Following the acid wash, the surface should be rinsed thoroughly with clean water.

For efflorescence to occur, water in liquid form must be present to carry any soluble alkalis or salts by capillary action to the surface where evaporation can occur. The water that carries the soluble salts may come from the subsoil when a concrete slab is in contact with the earth. In this case use of a vapor barrier below the slab may prevent efflorescence by blocking moisture flow from the subsoil.

If water is supplied to the tile or terrazzo, either from the top surface or from below as a result of dampness in the soil, or from other moisture bearing phenomenon, the hydrating process can continue indefinitely.

Control of efflorescence is normally directed towards control of moisture flow as it is generally not possible or practical to eliminate the source of the soluble alkalis or salts. Efflorescence rarely occurs on bare concrete where evaporation of moisture can take place over a large area and where carbon dioxide from the air can diffuse into the concrete and react with lime before it reaches the surface. When the concrete is covered with a less permeable material (for example ceramic tile or terrazzo) efflorescence may develop at joints where evaporation can occur most readily.

Since this material is subject to osmosis, it tends to move within the mass of tile or terrazzo toward a drying surface. In this instance, since the floor has been sealed with a polishing agent, the only drying or non-sealed surface left for it to pass through is the line of division formed by the terrazzo strip or the grouted joint.

When this material is concentrated at the dividing line or grouted joint, several things may be observed. One is discolouration, which in some instances looks like translucence in the tile or terrazzo floor and may cover an area three to four inches either side of the dividing strip or joint. This is caused by the excessive molecules of water concentrated there as they try to leave the mass.

Another reaction that may be observed is a deposit of calcium carbonate which builds up on the surface of the floor. This takes two forms – a soft amorphous crystalline form or a very hard crystalline form which may require the use of a grinding machine for removal. Tile should not be ground.

After one heating season, the hydration process may have ceased, and therefore there may be no further efflorescence. At this time, the building owner should consult a TTMAC Contractor and make arrangements to have the build-up which may have accumulated on the floor surface removed. The problem of efflorescence should not reappear.

For exterior installations that are subject to wet conditions, efflorescence may continue indefinitely. Provisions should be considered to minimize penetration of water from the surface and from below.

Measures that can be taken to control or reduce efflorescence include:
- Always use dry methods to remove efflorescence.
- Soft brush, soft blasting, and if possible vacuum the residues

WALLS
a) Incorporate air and vapour barriers during construction to prevent condensation of moist air from the interior face of exterior walls.
b) Provide properly designed flashing to prevent rain penetration into walls.

FLOORS
a) Provide moisture barriers under concrete in contact with the ground.
b) If wet conditions exist a drainage method should be provided. Manufactured drainage mats are available. A waterproofing layer/membrane should also be installed over concrete slab.
Installations should be done according to manufacturer's recommendations.
c) Allow concrete slabs to receive tile or terrazzo to cure for as long as possible before application of finished flooring.
d) When installing tile over mortar beds, allow mortar bed to cure for as long as possible and set tile by an approved thin-set method.
e) Delay grouting of installed tile as long as practical.
f) Delay application of surface sealers as long as is practical.

The appearance of efflorescence on a tile or terrazzo floor is not evidence of defective material or workmanship. When efflorescence does occur, care should be taken in removal so as not to damage the tile or terrazzo during the cleaning process. Efflorescence may occur in the form of a soft powdery deposit, which may be largely removed by brushing with a stiff bristle brush or in a hard-crystalline form, which on terrazzo may require the use of grinding for removal. On tile floors, efflorescence may appear on grout joints and usually removal will involve washing with a diluted acid solution. Care must be taken not to damage the tile surface or affect the color of the grout joints. The terrazzo or tile floor should be sealed with a water/emulsion base breathable sealer applied to a dry surface.

FREQUENTLY ASKED QUESTIONS

SEALERS

Q: Does a sealer render a stone, tile, or grout stain-proof?
A: No, sealers are designed to provide stain resistance. Performance is best described in "reaction time". Premium sealers provide longer reaction time than economical sealers. Reaction time is the time that a sealer will repel a liquid contaminant before the contaminant starts to penetrate the surface and create a sub-surface stain.

Q: How can I tell if my unglazed tile, stone, or grout is adequately sealed?
A: A simple test is to sprinkle water droplets in various spots. Allow the droplets to remain for 10 minutes or so, then blot with an absorbent towel. If the surface has slightly darkened, it should return to previous state within 2-3 minutes. If it stays dark longer or if water quickly absorbs into surface, additional sealer application is needed.

NOTE: The polishing process for porcelain tile opens up the micro pores at the surface, making them susceptible to grout pigment stains. It is recommended to treat polished porcelain with a solvent based penetrating sealer prior to grouting to eliminate this problem.

Q: Can porcelain tile be sealed, and if so, what kind of sealer is recommended?
A: Only unglazed porcelain and polished porcelain can be sealed, and only with a penetrating-type sealer.

Q: If my tile is not shiny does this indicate that the tile should be sealed for stain protection?
A: Most likely the tile has a matte-finish glaze. Even though there is no surface reflectivity, this glaze renders the tile impervious, and it will not accept a sealer. Should the tile be unglazed, it should show the same color on the surface, sides, and back. If in doubt, ask the supplier if the tile is glazed or unglazed.

Q: Does all grout need to be sealed?
A: With the exception of 100% solid epoxy grout, all cement based grout is porous and subject to contaminant staining. A sealer will provide much needed stain-resistance, creating "reaction time" to effectively clean up liquid contaminants before they penetrate.

NOTE: There are special grout admixtures available that can be mixed into cement based grouts to provide integral stain repelling.

Q: If I have a matte-glazed ceramic and want the tile to have a high-sheen finish, are there practical options available?
A: There are wax-type coatings that may be recommended on interior only, textured, matte finished tile. The downside is that these coating require increased maintenance and frequent re-application. In addition, wax-type coatings are affected by high alkaline cleaners, so the cleaning options are limited to neutral ph. cleaners unless the intention is to strip (remove) the coating.

Q: If my tile/stone/grout has been previously sealed and I do not know the name of the sealer that was used, can I use any sealer to re-seal?
A: First, identify if the sealer left a surface shine or not. If there is no shine/coating and water penetrates, a penetrating-type sealer will normally work as long as it can penetrate. If a coating-type sealer is desired to renew or affix a surface shine, it is critical to insure that a good bond is achieved.

Q: Can penetrating-type sealers be used on all porous stone and tile surfaces?
A: Yes, as long as there is at least minimal porosity and absorption, they can be used. Most penetrating-type sealers can be used on both interior and exterior applications.

Q: Some stone, such as polished marble is sensitive to acidic contaminants. Will a penetrating-type sealer protect these stones from acids?
A: No. Penetrating or "impregnator" type sealers are designed to protect below the surface, so the actual surface is not left with a protective coating and is still susceptible to acid etching. Coating sealers unfortunately do not bond effectively to smooth, polished surfaces, and are not recommended for this reason.

Q: If my stone has a polished (shiny) finish, does it still need to be sealed?
A: Most marble, granite, travertine, limestone, quartzite, and even some slates and sandstone are available in a polished finish. All of these polished materials are still porous, subject to staining, and should be sealed with a penetrating-type sealer.

Q: If I have a porous stone or tile, do I need to use different sealers for the tile/stone and grout?
A: No, when sealing porous stone and tile, it is most always recommended that the entire installation (including grout) be sealed at the same time using the sealer chosen for the stone or tile. In the case of glazed tile (the glaze which is fi red glass acts as the sealer), only the grout should be sealed, and any sealer that gets onto the glazed surface should be removed completely with a dry towel before it is allowed to dry on the tile.

NOTE: With a porous tile or stone, it is recommended to treat first before grouting to act as a grout release. Then do a second treatment with penetrating sealer after grouting.

Q: Can I use coating (topical) type sealers on all porous stone and tile surfaces?
A: No. Generally speaking, coating-type sealers are limited to very high-porosity tiles and stones such as terracotta, sandstone and slate, or to surfaces that have very rough-textured surfaces.

Q: I want to use a stone that is sensitive to freezing. The stone will be used exterior. Will a good sealer protect the stone from the effects of freeze-thaw conditions?
A: No. Sealers are not designed to render freeze-sensitive stone freeze-thaw stable. Even though a sealer may help in this regard by helping to keep water from entering from the surface, it must be remembered that moisture can enter from below or from other areas. It must also be noted that sealers are not "water-proofers", they merely help to resist and reduce water infiltration from the sealed surface.

Q: How long will my sealer last?
A: This can vary from one year to 10 years or even longer. Premium penetrating-type sealers will normally provide the longest life, whereas coating-type sealers, must be re-applied much more frequently. Other key factors that influence useful sealer life are traffic conditions, exterior versus interior environments, cleaners used and maintenance procedures.

Q: Do sealers last as long under exterior conditions?
A: No, generally about half the life can be expected should the same sealer be used in an interior environment. This is due to nature's elements such as sun (UV), rain, various contaminants (some abrasive), and temperature extremes, causing pronounced contraction and expansion.

Q: Which type of sealer is better: solvent-based or water-based?
A: The fact is that, in general, neither is better. It should be understood that neither the solvent nor the water reflects the quality of the sealer. Rather, it is the polymer that is left in place. The solvent simply "flashes" off as the sealer is applied, leaving the polymer or sealing component in place. In the case of a water based sealer, the water evaporates, leaving the polymer in place. Therefore, it is the quality of the polymer that determines sealer performance. It should be noted that on extremely dense, low-porosity surfaces such as unglazed porcelain or polished marble, a solvent will penetrate the surface a little easier than water, so solvents may be easier to use. On the other hand, water, not penetrating as quickly as traditional (oil-based) solvent, will actually work better on more porous tile and stone as there is no benefit in penetrating deeply, as the best benefit can be achieved by keeping the polymer just below the surface where it can provide maximum protection.

Q: I am installing porous stone/tile. Do I need to pre-seal prior to grouting?
A: Pre-sealing is always recommended on porous tiles. You should always do a test to determine whether a porous tile or stone can be grouted and easily cleaned, showing no staining from grout pigment. In general, the only very porous tiles such as terracotta, or stones where a highly contrasting grout color are used, need to be pre-sealed. If the need to pre-seal is determined it is almost always recommended that an application of the sealer that is chosen for the finished installation, be used to pre-seal before grouting. On porous material, it's better to apply several coats of solvent/alcohol based sealer. If using a water based sealer you can only put one heavy coat of sealer, no more coats can be applied after that.

Q: How long will my sealer last?
A: This will vary depending on area of installation (interior or exterior, floor, countertop or wall), type of sealer (coating or penetrating), premium or economical, and type of tile, stone, or grout. It should be noted that both acidic and base (high pH degreasers) should be used only when needed, as they will reduce the lifespan of sealers.

Q: I used a penetrating-type sealer. Now there is a dull residue on my tile. What caused this problem and how do I fi x it?
A: All penetrating-type sealers are designed to penetrate into porous tile and grout. In the case of getting the sealer on a glazed surface where there is no porosity or on a very dense, low-porosity surface, the sealer will leave a dull residue if not wiped dry within a few minutes of application. It is advised to contact the manufacturer's technical service hotline for their recommendation for removal of sealer residue.

Q: I used an enhancer sealer to highlight and darken my slate. It is now shiny in spots and has an oily, tacky feel on the surface. What happened and how do I correct this problem?
A: Most enhancer-type sealer directions state that whatever sealer does not penetrate into the porous slate must be completely removed from the surface before it is allowed to dry. Colour enhancer sealer is a very thick product. Apply very small quantity and buff with microfiber or white pads to remove excess. Always do a test spot first and never mix color enhancer with acetone. Here, the sealer was allowed to dry on the surface or was not completely removed per manufacturer's directions. The best way to remedy this problem is to contact manufacturer's technical hotline for best remedial directions.

Q: The grout color that I selected dried much lighter than the sample I selected. Is there any recourse short of replacing the grout?
A: Yes, if the grout is structurally sound and hard, there are grout colorants/stains available from a variety of manufacturers designed to create an even color or even change the overall color of the grout. These are generally easy to apply and some even provide excellent stain protection. Enhancing sealers may also be considered as may light acidic cleaners (only used a minimum of 10 days after grouting) should the discoloration be due to efflorescence.

Q: If my grout has been previously sealed, can I still use a grout colorant/stain to recolor?
A: Possibly. It is critical that the colorant/stain achieves a good bond to a clean, dry grout joint. It is best to contact manufacturer's technical hotline for their recommendations.

CLEANERS

Q: What should I use for routine cleaning on stone, tile and grout?
A: It is always advisable to use a neutral pH cleaner. Neutral pH cleaners are excellent cleaners that will not adversely affect tile, stone, grout or existing sealers. Most Tile and Stone distributors carry neutral cleaners designed for safe, everyday use on tile, stone and grout surfaces.

Q: There are many household cleaners on the market. What do I need to be careful of when selecting a cleaner for my stone, tile or grout?
A: Many of the cleaners marketed for hard surfaces contain acid. Acid cleans by chemically attacking minerals. Thus, acidic cleaners can be very damaging to cement grout joints, and harm stones with calcium content such as marble, limestone and travertine. Acids also do a poor job of degreasing.

Q: Are there any simple "rules of thumb" for cleaning tile, stone and grout surfaces?
A: Yes. Always use neutral pH cleaners for routine cleaning. If the tile or stone has a rough-textured surface it is a good idea to periodically use a soft scrub brush to agitate and release any contaminants from the lower extremities prior to rinsing. One of the biggest mistakes commonly made in using cleaners is that cleaners are never allowed ample time to dwell on the surface. Cleaners should always be given a proper dwell time (read directions) to perform effectively. Also, when attempting to remove/clean stains, always do a small test first with the recommended cleaner just to make sure there are not unintended side effects.

Q: If a liquid contaminant is spilled on my tile, stone, and/or grout, what procedure should I use for removal?
A: Don't make the mistake of spreading the contaminant. The first step is to blot the liquid contaminant using an absorbent paper or cotton towel. Once all standing liquid has been blotted, a quick test can be done to see if a wetted towel can remove complete (indicating that there was no penetrating into the tile, stone or grout) or if additional cleaners/methods will be needed. These can range from using a strong degreaser (high ph. cleaner) to using a poultice-paste to extract a subsurface stain.

STONE RESTORATION

Q: My polished marble has a dull spot where I spilled some juice. What caused this and how can I restore the shine?
A: Marble is a calcium-based stone and is acid sensitive as are limestone and travertine. The dulling was caused by acid (contained in many drinks and cleaners) coming in contact with the stone surface. There are specialty liquids and compounds available through Stone distributors designed to repolish etched spots and areas.

Q: Can I take a limestone, marble or travertine floor and create an even, unpolished finish without harming the stone?
A: Yes, there are products available that are designed to create an even, honed (non-polished) finish on previously polished marble, travertine, limestone, cement and most terrazzo surfaces. Contact your stone supplier for information on products available.

MAINTENANCE

Do:

- Always use "neutral pH" cleaners for routine cleaning of tile, stone and grout.
- Keep walking surfaces clean and dry to reduce possibility of "slip-fall" accidents.
- Read label direction completely before using product.
- Test products on small area to determine desired results.
- Never mix different products unless approved by manufacturer.
- Utilize alkaline (high pH) cleaners periodically for neglected areas subject to food-contaminant soiling, and on textured surfaces.
- Utilize a scrub brush periodically in place of a sponge or mop on textured surfaces that tend to hold onto dirt and other contaminants.
- Use mild acidic cleaners only when problems exist such as cured cement grout residue or mineral deposits. Even the safer-type acids should not be used on acid-sensitive surfaces such as polished marble.

NOTE: For other types of grout (epoxy, urethane, acrylic) consult the manufacturers for the appropriate cleaning product.

Do Not:

- Use strong acid cleaners such as hydrochloric (Muriatic) as it can seriously damage acid-sensitive stone, tile and grout. Even the fumes can cause human and collateral damage.
- Mix different products together unless specifically OK'd by manufacturer.
- Forget to do a small test area to determine desired results.
- Use products without first reading front and back labels.

TERRAZZO

Q: Why doesn't my new cement terrazzo floor have the sheen and luster of other older and similar floors?" "Mine looks blotchy, dull and has little sheen"
A: There will be a sufficient difference in appearance between a new terrazzo floor and one that has aged. Terrazzo, like fi ne wines, gets better with age. At present, your new floor may lack the beauty you initially expect, however, with natural cure, proper maintenance and the passing of time, your terrazzo floor will have the luster, sheen and beauty that terrazzo is well known for.

To further explain why this occurs, we offer the following information:

A lot of water is added to the Terrazzo in the process of its composition in regards to mixing, curing, grinding, grouting and polishing stages. This quantity of moisture is required to assure a quality installation. This moisture is expected to dissipate and escape through the finished surface. It is necessary to regulate the moisture evaporation. Therefore, new terrazzo must be sealed with a penetrating type sealer. This further increases the time it takes for the system to cure. This trapped moisture will migrate to the area adjacent to the strips, causing this immediate area to be darker until the Terrazzo is completely dry and cured. It is not unusual for this moisture to create efflorescence and/or tarnish the metal dividing strips. This situation can be remedied by maintenance personnel using an 80 -grit or finer 3-M type screen mesh pad under the scrubbing machine during normal maintenance procedures.

The building must first be climate controlled and the terrazzo floor thoroughly cured before this will be effective. The curing time will vary depending upon temperature, humidity and ground water conditions. After the tarnish is removed at the dividing strips, the screen pad should not be used. Each passing day, with normal maintenance, the aesthetics of the Terrazzo floor will continuously increase. Obviously, this requires patience, but rest assured the results will be extremely rewarding.

GLOSSARY

Abrasion Resistance – The ability of a surface to resist being worn away by rubbing and friction.

Abrasive Aggregate – Aluminum oxide to No. 36 graded size, used as an additive to terrazzo or cement toppings to increase the coefficient of friction/slip resistance (COF) on non-slip finished surfaces.

Absorption – The relationship of the weight of the water absorbed by a ceramic specimen subjected to prescribed immersion procedure, to the weight of the dry specimen, expressed in percent. (ASTM C242)

Acid – A chemical substance usually corrosive to common metals (iron, aluminum, zinc). Acids are generally divided into two classes: a) a strong mineral inorganic acid such as sulfamic, sulphuric, phosphoric, hydrochloric or nitric, b) weak organic or natural acids such as acetic (vinegar, citric citrus fruit juices), oxalic and fatty acids (oleic, palmitic, stearic, etc.)

Acidic Cleaners – Acids and cleaners containing acid have a low ph. of 1 to 6. They can best be described as problem solvers, and clean primarily by chemically attacking any surfaces with exposed minerals. Acids, especially stronger acids such as muriatic, can be very damaging to grout, metallic glazes and stone containing calcium, such as marble.
Weaker acids such as phosphoric and sulfamic are the acids recommended for removal of cementitious grout film and hard water deposits.

Acid Resistance – See chemical resistance.

Acrylic – A general class of resinous polymers used as additives for thin-set mortar and grout. See Latex-Portland Cement Mortar or Grout.

Admixture – A material such as acrylic or latex used as an additive to concrete or mortar immediately before or during mixing. Admixtures can enhance the technical properties of standard Portland cement mortars.

Agglomerate Marble – A mixture of various marble chips bonded together with polyester resins.

Agglomerated "Stone" – A product made from quarry waste.

Alkali – A chemical substance which effectively neutralizes acid material to form neutral salts. A base the opposite of acid. Examples are ammonia and caustic soda.

Alkaline Cleaner – A cleaner that has a higher ph. of 8 to 14. These alkaline or "base" cleaners have stronger degreasing capabilities for heavy-duty cleaning, yet are still considered safe for use on tile, most stone and grout.

ANSI – American National Standards Institute, a non-profit national technical association which publishes standards covering definitions, test methods, recommended practices and specifications of materials.

Broom Surface – The surface texture obtained by stroking a broom over freshly placed concrete. Also brushed surface.

Calcite – One of the most common minerals - calcium carbonate. It occurs in crystalline forms and is a major constituent of limestone, marble and chalk. Marble containing no more than 5% magnesium carbonate (dolomite) is sometimes called calcite marble.

Capillary Action – Saturation of the substrate caused by the rise and fall of liquid and may travel from lower to higher elevations.

Ceramic Mosaic Tile – Tile formed by either the dust-pressed or plastic method, usually 6 mm thick, and having a facial area of 100 cm2 or less. Ceramic mosaic tiles may be either porcelain or natural clay composition and they may be either plain or may have an abrasive mixture throughout.

Ceramic Tile – Body of the tile is usually relatively thin and made from clay or a mixture of clay and other ceramic materials. May have either glazed or unglazed face and is fi red above "Red Heat". This terminology is a general description for all tile types and classifications.

Chemical Resistance – The resistance offered by tile to physical or chemical reactions as a result of contact with or immersion in various solvents, acids, alkali's, salts, etc.

Cleaner – A neutral PH liquid detergent or soap, with suitable sequestering agents for use in general maintenance and cleaning of terrazzo.

Coefficient of Friction/Slip Resistance (COF) – The measurement of static slip resistance between ceramic tile and stone under both wet and dry conditions while utilizing Neolite heel assemblies.

Commercial Portland Cement Grout – A mixture of Portland cement with other ingredients to produce a water resistant, dense, uniformly coloured material.

Curing – Maintenance of humidity and temperature of the freshly placed mortar or grout during some definite period following the placing or finishing, to assure satisfactory hydration of Portland cement and proper hardening of the mortar or grout.

Double-Fired Tile – Glazed tile produced by an initial fi ring of the shaped, raw materials to produce a hard tile body and then re-fi red once the glaze or decoration has been applied.

Double Loading – Porcelain tile that is dry pressed with a second application of powders that is repressed into the body before fi ring, achieving unique, through body tile.

Dry-Set Mortar – A mixture of Portland cement with sand and additives to impart water retentivity, which is used as a bond coat for setting tile. Normally, when this mortar is used, neither the tile nor the walls have to be soaked during installation.

Efflorescence – The residue deposited on the surface of a material, usually the grout joint, by the crystallization of soluble salts. May appear as a whitish powder or crust and caused by moisture reacting with impurities in the mortar.

Efflorescence Removers – Non-acidic or acidic liquids designed to remove soluble salts that occur as the result of moisture reacting with soluble minerals that are often present in the soil and cement.

Epoxy – Can be an adhesive, grout or mortar. A two-part system consisting of epoxy resin and epoxy hardener. Used where chemical resistance or high bond strength is a consideration or for joints where impervious qualities, stain and chemical resistance are required.

Epoxy Resin – A flexible, usually thermal setting resin made by the polymerization of an epoxide and used as an adhesive.

Epoxy – A two component liquid resin consisting of bisphenol A and epichlorohydrin generally referred to as Part A and B. Epoxy is a two-component mix of epoxy resin plus hardener used to bind the aggregate chips in the terrazzo topping.

Expansion Joint – A joint that extends through the stone, tile and bonding material and substrate. They are designed to allow for continuous movement in the building structure caused by expansion and/or contraction due to thermal change or other influences.

Field Tile – An area of tile covering a wall or floor. The field may be bordered by contrasting tile or tile trim.

Flamed Finish – See "Thermal Finish".

Flamed (Thermal) Surface Finish – A flamed or thermal surface finish is achieved by passing a 2,800-degree F torch flame over the surface of the stone. This process heats the various minerals and crystals and expands them until they explode or break from the body of the stone. The result of this thermal process is a coarse, irregular surface finish with an exposed port structure. The flamed finish creates a look and texture which is desirable in certain applications. However, this open porosity also exposes the stone to weathering and other moisture-bearing contaminants. Generally, only granites and a few other stones can be successfully flamed due to the amounts of dissimilar minerals present with different coefficients of thermal expansion.

Flexural Strength – A property of a material or structural member that indicates its ability to resist failure in bending. May also be referred to as the Modulus of Rupture.

Frost Resistance – Tiles whose properties, including low porosity and water absorption levels, cause it to be minimally affected by freezing and thawing conditions and hence suitable for exterior conditions.

Floor Finish – A synthetic liquid wax designed to add a protective sheen coating over sealed hard surfaces.

Glazed Tile – Tile with a fused impervious facial finish composed of ceramic materials fused to the body of the tile, which may be non-vitreous, vitreous or impervious.

Grout – Materials that are used in the joints between tiles after installation with additives to impart specific characteristics and colours. Generally, the composition of grout is similar to that of mortar, however, non-cementitious grouts are also available.

Grout Colorant – A pigmented paint-like liquid designed to recolor, and provide a degree of stain protection to existing grout

Grout Film Removers – Non-acidic versions are used to remove grout haze during the first few days after grouting when an acid-based remover may be potentially damaging to the new grout. Mild, acidic versions are designed to remove grout film after full grout cure.

Grout Joint – The space left between tiles and filled with grout. This space may be narrow or wider depending on the required installation and its aesthetics. Normal floor joint width is 2 mm to 6 mm.

Granite – A very hard, crystalline, igneous rock, composed of feldspar, quartz and lesser amounts of dark ferromagnesium materials. Gneiss and black "granites" are similar to "true" granites in structure and texture, but are composed of different materials and type of rock.

Grinding – A method using mechanical power equipment and abrasive material to roughen a surface that is too smooth or to improve the appearance of a surface that is too rough.

Hone Finish (or honed) – A satin smooth surface finish with little or no gloss. This finish is recommended for commercial floors.

Honing – A process designed to turn a polished or rough tile or stone surface into a smooth, non-reflective surface. This can be done mechanically, usually with diamond pads, or chemically with abrasive powders or liquids, normally containing mild acids.

Latex – A water emulsion of a synthetic rubber or plastic obtained by polymerization used as an additive in cementitious bonding material.

Latex-Portland Cement Grout – A Portland cement grout mixed with a special latex additive.

Latex-Portland Cement Mortar - A mixture of Portland cement, sand and a special latex additive which is used as a bond coat for setting tile.

Limestone – A sedimentary rock composed primarily of calcite and dolomite. The varieties of limestone used as dimension stone are usually well consolidated and exhibit a minimum of graining or bedding direction.

Mastic – Organic tile adhesive.

Matrix – There are three different types of matrix: Polyacrylate is a mix compounded from liquid polyacrylate copolymer and dry co-reactant composite. Portland cement and water mix used to bind aggregate chips in the terrazzo topping.

Moisture Expansion – An increase in dimension or bulk volume of a ceramic article caused by reaction with water or water vapor.

Mortar – A mixture of one part cement to four parts sand mixed to a semi dry slump, placed over the slab as a base, to provide a level plane for the terrazzo topping and a bed for the divider strips.

Mosaics – Small tiles or bits of tile, stone or glass which are used to form a surface design or an intricate pattern.

Marble – A metamorphic recrystallized limestone, composed predominantly of crystalline grains of calcite or dolomite, or both, having interlocking or mosaic texture. Marble has been redefined to include all calcareous rocks capable of taking a polish such as travertine, and attractive serpentine rocks.

Natural Stone Tile – Material taken from a quarry and processed into various sizes, thicknesses and finishes.

Neutral Cleaner – A cleaner that has a neutral ph., usually defined as 6 ½ to 7 ½ on the ph. scale. Neutral ph. is considered as the safest type cleaner for routine cleaning of tile, stone & grout.

Non-vitreous Tile – Tile with water absorption of more than 7%.

Oxidization – A reaction to the loss of electrons in the metal often resulting in corrosion where the corroded metal forms an oxide, elevated temperatures increase the rate of oxidation.

Paste wax – A natural or synthetic paste that provides the same function as a floor finish.

PH – The negative logarithm of the hydrogen ion concentration in mol/liter. Measure of the acidity or alkalinity of an aqueous solution. pH=7 represents neutrality, i.e. the solution is neither acid nor alkaline. pH values from 0 to 7 are acidic, the lower the pH value, the higher the degree of acidity; pH values from 7 to 14 represent alkalinity. The higher the pH value above 7, the greater the degree of alkalinity (CED).

Polished Surface Finish – A glossy surface which brings out the full colour and character of the stone. The higher the sheen or polish, the more resistant the stone will be to damaging conditions such as moisture, acidic solutions, and air pollutants.

Porcelain Tile – A ceramic tile that is generally made by the dust-pressed method from a composition that results in a tile that is dense, impervious and fi ne grained with a sharply formed face.

Portland Cement – Materials containing appropriate amounts of calcium compounds, silica, alumina and iron oxide that are crushed and screened and placed in a rotating cement kiln. Ingredients used in this process are typically materials such as limestone, marl, shale, iron ore, clay and fly ash.

Poultice – A powder or paste designed to pull stains from porous tile, stone and grout substrates. Some are also recommended to be used in conjunction with cleaners to increase the cleaning capability and results.

Precast – Terrazzo fabricated in molds, in a shop or factory, by a compression and vibratory method.

Quarry Tile – Glazed or unglazed tile made by the extrusion or dust pressed process from natural clay or shale, usually having 39 cm2 facial area.

Quartz-Based Stone – This stone may be either sedimentary in formation (as in sandstone) or metamorphic (as in Quartzite).
(Note: Definitions of three classes of stone which form a Quartz-Based Stone Group are explained in ASTM C119.)

Quartzite – Classified as metamorphic sandstone, it is 95% free silica with hardness close to granite. A metamorphic quartz-based stone formed in exceedingly hard layers. In some deposits, intrusion of minerals during the formation process created unusual colouration.

Quartzite Sandstone – Sandstone containing at least 90% free silica (quartz grains plus siliceous cement), which may fracture around or through the constituent grains.

Re-Crystallization – Normally referred to as a process where a worn marble, or other stone containing calcium is re-polished with the use of a low RPM polishing machine and steel wool pad, creating heat, along with a liquid, normally containing an acid blend. This resultant combination of heat and chemical creates a chemical reaction with the surface layer of the stone, resulting in a renewed polish, usually not as perfect as the original factory polish. This process is often used in commercial areas to maintain a polished marble installation.

Recrystallized Limestone – A limestone in which a new pattern of crystallinity has pervasively replaced the crystal orientation in the original clastic particles, fossils or fossil fragments and interstitial cement. The new generation of crystals, encompassing both fragmental and matrix materials, extends across boundaries between former crystals. The new crystals generally are larger than those of the original rock. Evidence of original textures may or may not be retained

Release Agent – Material used to prevent bonding to concrete to a surface.

Sandstone – Sedimentary rock of quartz, sand and carbonates composition. Some stones are suitable for heavy floor traffic and some will even take a polish. Check data sheets for suitability and sizes.

Sand Blasted – a dull non-glossy finish applied to stone; usually accomplished by blasting air blended with sand across the surface.

Sand Blasting – Blast cleaning a surface with silica sand, flint, or other crystalline silica abrasives to remove dirt and to roughen a surface in preparation for coating.

Sand Finished – A matte textured surface finish with no gloss; finished by application of a steady flow of sand and water under pressure.

Scarifying – A method of mechanically preparing concrete or other surfaces for coating, using a self-contained unit resembling a plant sweeper with sharp rotating blades.

Sealer – Liquid substance applied to porous tile, stone, grout, or concrete surface designed to provide a degree of stain protection.

Sealers – Coating-type sealer: A sealer designed to form a protective film on the surface which will result in a low, medium or high sheen finish.

Color-Enhancer Sealer – A sealer designed for porous stone to provide a wet-look or darkened appearance.

Grout Sealer – A sealer formulated primarily for use on porous cementitious sanded and non-sanded grout.

Penetrating or Impregnator Sealer – A sealer designed to penetrate into a porous surface, leaving no visible sealer or coating on the surface.

Pre-Grouting Sealing – The process of applying a "grout release" or an application of the primary sealer that will be applied to the finished installation. This pre-sealing procedure is designed to provide protection from grout pigment staining during the grouting process. A secondary benefit is to ease the grout cleanup process.

Semi-vitreous Tile - Tile with water absorption of more than 3%, but not more than 7%.

Shot Blasting – A surface preparation method that uses cast steel shot propelled by centrifugal force to clean and/or profile a surface in preparation for coating.

Substrate – The underlying supports for the terrazzo installation.

Slate – A natural quarried fi ne grained metamorphic rock or material, available in multiple shapes and sized, thicknesses and colours, (Gauged or ungauged), natural cleft finish, non-slip wet or dry, other finishes available to special order. Most frost proof, acid resistant, noncombustible, low absorption, sanitary and easy to clean maintain.

Slip Resistance – The ability of a surface to prevent sliding or loss of footing.

Slip-Resistant Tile – Tile having a higher coefficient of friction due to an abrasive admixture, abrasive particles in the surface or grooves or patterns in the surface.

Split Face Stone – Stone on which the face has been broken to an approximate plane.

Strippers – A term usually referred to as a liquid substance designed to remove existing sealers, mastic and epoxy grout haze. Many strippers contain strong solvents, are flammable, and should be used with great caution and care.

Sub Floor – An underlying surface to receive or support terrazzo.

Surface Temperature – The degree of heat of a surface measured by a thermometer.
Surfacing – The grinding, grouting, and finishing operations on terrazzo topping.

Telegraphing – A common industry term to describe cracking conditions that originate from within the assembly and/or substrate and migrate to the surface.

Terrazzo – A form of mosaic flooring made by embedding pieces of aggregate chips in matrix.

Terrazzo Tile – A cementitious product containing graded coloured chips of marble, granite or other composition chips of various sizes. Usually each tile is individually cast in moulds, mechanically vibrated and hydraulically compressed during manufacture. Tile may be prefinished or ground in place.

Thermal Expansion – All materials expand and contract to some extend with changes in temperature. The Thermal Coefficient of Linear Expansion is expressed in millimetres per millimetre Inch per Degree Celsius.

Thermal Finish – A rough surface finish that tends to subdue the colour and markings of granite.

Thin-set – A term used to describe the bonding of tile with suitable materials applied approximately 3 mm thick.

Thin-Set – Terrazzo system which can be applied over a smooth concrete slabs or other suitable substrates at a minimum thickness of 6 mm to a maximum of 13 mm.

Vitreous Tile – Tile with water absorption of more than 0.5%, but not more than 3%.

Water Absorption – The ability to take up and retain water, expressed as a percent of the dry tile weight.

Wet Areas – Tile surfaces that are either soaked, saturated or subjected to moisture or liquids (usually water) such as gang showers, tub enclosures, showers, laundries, steam rooms, swimming pools and exterior areas.

White-body – Tile composed of raw materials producing a white tile body that can be coated with a transparent glaze and takes colour easily. Normally used for wall tiles.

METRIC CONVERSION GUIDE

To convert inches to millimetres, multiply the number of inches by 25.4 to obtain millimetres. To convert feet to millimetres, multiply the number of feet by 304.88 to obtain millimetres. To convert millimetres to feet multiply the number of millimetres by .00328 to obtain feet.

For a reference only, some common (rounded nominal) industry metric conversions to the imperial equivalents follow:

1 mm = 1/32 inch	30 mm = 1 1/8 inches	305 mm = 12 inches
2 mm = 1/16 inch	32 mm = 1 1/4 inches	356 mm = 14 inches
3 mm = 1/8 inch	38 mm = 1 1/2 inches	406 mm = 16 inches
6 mm = 1/4 inch	51 mm = 2 inches	480 mm = 19 inches
8 mm = 5/16 inch	75 mm = 3 inches	610 mm = 24 inches
10 mm = 3/8 inch	102 mm = 4 inches	1000 mm = 39 3/8 inches
11 mm = 7/16 inch	125 mm = 5 inches	1220 mm = 4 feet
13 mm = 1/2 inch	152 mm = 6 inches	2439 mm = 6 feet
16 mm = 5/8 inch	180 mm = 7 inches	3049 mm = 10 feet
19 mm = 3/4 inch	203 mm = 8 inches	3659 mm = 12 feet
25 mm = 1 inch	280 mm = 11 inches	4878 mm = 16 feet

NOTES

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