USER MANUAL

Ceramic Tile Related Article

ANSI 137.1 1988
The results of this testing procedure establish minimum standards for the various types of tile and trim. Also, the testing reveals certain characteristics of the tile such as:

- water absorption
- abrasion resistance
- impact resistance
- breaking strength
- stain resistance
- visual quality The water absorption characteristic is of particular importance as it places the tiles into one of four types of tile.

Type of Tile Water Absorption Potential	
non-vitreous tile	+7.0%
semi-vitreous	3.0-7.0%
vitreous	.5-3.0%
impervious	less than .5%

The testing will result in the tile being placed in one of three categories.

Grade ANSI Requirements	
Standard	tile that passes all the minimum standards and will pass the visual examination at a distance of 3 feet.
Seconds	will pass the minimum standards and visual exam at 10 feet.
Culls	tiles that do not pass at all and are discarded or not used for their intended purpose.

Ceramic Tiles - Important Characteristics

Ceramic tiles share remarkable qualities that give them an edge for meeting many interior requirements. However, just like any other flooring, there are some considerations to be taken into account when selecting ceramic tiles. Some of those considerations are:

durability

slip and stain resistance

water absorption.

Generally, these are judged in terms of application, location and the conditions the tiles will need to endure.

While selecting and buying any type of tiles for your property, it's important to consider the following characteristics to make the right selection.

1. **Abrasion Resistance**: The ability of a ceramic tile's glaze or surface to stand firm under continuous wear is an important consideration while choosing a glazed ceramic tile for floors. Locations under heavy traffic like commercial buildings or residential entryways and kitchen require ceramic tiles with

good abrasion resistance. If the chosen ceramic tiles have the necessary wear rating, they can last for a long time with proper maintenance.

2. **Water Absorption**: Properly installed and grouted, ceramic tiles are an excellent choice for use in wet areas. But while the glaze of ceramic tiles is nonporous, a glaze tile may absorb water through its body. Any glazed or unglazed ceramic tile that absorbs more than 3% moisture is unsuitable for outdoor usage in climates where freezing conditions may occur.
3. **Frost Resistance**: Frost resistance is directly relevant to water absorption in ceramic tiles. The less water a ceramic tile absorbs, the greater its frost resistance. Exterior applications require highly frost resistant tiles. Often, porcelain tiles become the material of choice for such conditions.
4. **Fire Resistance**: Due to a noncombustible composition, ceramic tiles are completely fireproof at any temperature. They work especially well around open flames, hot objects (crockery, barbecues, etc), or any other areas characterized by the high frequency of extremely high temperatures. A ceramic tile's surface will not alter, nor will they produce any toxic gases, smoke or fumes during a fire. Ceramic tiles will not burn or feed to a fire in any way. They also act as a protection for structural surfaces.
5. **Stain Resistance**: The ability of ceramic tile to withstand permanent staining by a variety of substances is also important. The stain resistance of ceramic tile varies depending on its capacity to resist moisture. Glazed ceramic tiles and even some unglazed tiles resist all types of stains and can be cleaned easily with some guidance.
6. **Slip/Skid Resistance**: One practical consideration is the level of slip resistance your ceramic tile floor requires. Slip resistance involves two factors - your ceramic tile floor's likely exposure to spills and your environmental requirements. The more your floor will be exposed to spills, the higher your need is for a slip- resistant floor tile. Also, homes with younger children, disabled or elderly people need to have floor tiles with slip resistant characteristics. Ceramic tile manufacturers with the use of various glazes, glaze additives, and patterns have developed slip resistant tiles. Also, the ceramic tile size, grout joint spacing, and slope of the floor will affect the slip resistance. In addition, unglazed ceramic tiles have greater slip resistance than glazed tiles and are recommended for areas subjected to frequent water spills or heavy foot traffic.
7. **Dirt Resistance**: Ceramic tiles do not retain dust or residues as easily as many other flooring surfaces. They can be easily cleaned with common household materials. Additionally, they do not need polishing or buffing to maintain their finish. A day-to-day cleaning procedure retains the look of the finish and shine on ceramic tile flooring.
8. **Color Permanence**: Because color is fired into a tile's clay body (in the case of unglazed tiles) or onto a tile's glazed surface (for glazed tiles), fading cannot occur. The colors in ceramic tiles do not fade even if exposed to direct sunlight (and its color-leaching UV rays). They remain permanently color fast.
9. **Hygiene**: The surface of ceramic tiles does not easily retain antigens or allergens, nor do they absorb fumes, odors or smoke. This feature enables good hygiene and makes ceramic a suitable flooring material for any environment where hygiene is essential.

What is the difference Ceramic and Porcelain Tile

What is wear layer?

The top layer of a flooring material that covers a patterned effect is called wear layer.

What is meant by stain resistance?

Stain resistance is a characteristic whereby the tile withstands the absorption of moisture and other substances that would otherwise remain in the tile body.

What is meant by a polished tile?

A tile with a glossy surface finish that reflects light and emphasizes the color and marking of the material is a polished tile. This finish is achieved by sanding or grinding the tile with diamond heads.

What is ceramic tile?

Ceramic tiles are made from a mixture of clays which have been shaped, colored and fired at high temperatures, resulting in a hard body. This hard body may then be left untreated or it may receive a glazed wear layer. Ceramic tile is a surfacing unit, and has been used for covering roofs, floors, walls and countertops.

What is porcelain tile?

Made from fine-grain clay and minerals, porcelain tile is a ceramic product with a very hard, solid structure. The body of each porcelain tile is very resistant to moisture (classified as impervious), and is therefore less likely to stain. Porcelain tile is a very hard tile option, and is typified by its resistance to wear and tear over long periods of time.

What is the difference between porcelain tile and ceramic tile?

Porcelain tiles are also ceramic tiles. They are a specified form of ceramic tiles, but composed of much fine and dense clay and fired at much higher temperatures, if compared. Porcelain tiles are made by clay with water absorption rating of less than 0.5%, while ceramic tiles have a clay composition with water absorption of more than 0.5%.

This composition makes porcelain tile more homogenous, dense, much stronger and less prone to moisture absorption and staining. For those reasons porcelain can be suitable for locations with extreme moisture and in freeze or thaw conditions. Not all ceramic tiles can be installed at locations with freezing weather, due to the likelihood of moisture freezing inside the tiles. Internal freezing causes the moisture to expand as it freezes, which often manifests as cracks in the tile.

Porcelain is homogenous in terms of through-body color. Porcelain tile is less porous and therefore less prone to cracking. Porcelain tile is more scratch resistant than most ceramic tile.

How is the hardness of the glaze determined?

Glaze is a liquid glass that is sprayed or poured onto the surface of the tile. The glaze is then fused and hardened by means of very high temperatures. Colors are created from a mixture of minerals, such as gold, silver, zinc, copper, mercury, and cobalt. Strength and wear resistance of the tile is reinforced by the hardness of the glaze. The harder the glaze, the better the tile will stand up to pressure and abrasion. Glaze hardness is determined by:

Temperature

The higher the kiln (oven) temperature is, the harder the glaze will be.

Color

Light-colored glazes are usually harder than dark-colored ones.

Gloss Level

Matte-finished or satin-finished glazes are generally harder. Shiny glazes are usually softer and less durable.

The Ceramic Tile Manufacturing Process

Ceramic tile for floors is baked at very high temperatures, resulting in attractive and very hard surfaces. The **ceramic tile floors** manufacturing process results in a huge choice of color, size, finish and shape in wall and floor tiles. The process is comprises the following steps:

Formation of Body Slip

The first and the foremost step in the manufacturing of ceramic tile floors is the formation of body slip. Body slip is formed by blending raw materials such as clay, feldspar, sand, dolomite, and quartz with 30% of water. After blending, it is grounded in a ball mill to get the body slip.

Spray Drying of Body Slip

After the formation of body slip, the material which will soon be made into ceramic tile floors is now put into a spray dryer and heated at high temperature. When the body slip is heated, it is transformed into powder which contains moisture of about 6%. The powder is then sent to presses to form bisque (body).

Production of the Bisque

The powder is then compacted into dies through a press that operates at a pressure of several hundred pounds per square foot. The result of the pressure is a clay body, or bisque. This early stage in the ceramic tile floors manufacturing process will account for their durability later on.

Drying of the Bisque

The bisque is now heated at high temperature by using natural gas. This process removes the moisture from the bisque. The strength and stability of the bisque (body of the **ceramic tile floors**) depend upon the raw materials and density.

Glazing Process

The glazing process enables the best possible results in color, weight, viscosity and density of the ceramic tile flooring. There are many ways of applying glazes to ceramic tile for flooring which includes silkscreen patterns, spray glazes, waterfall glazes, brushes, and roto screens, etc. These glazes enable a beautiful finish. The now glazed but unfired ceramic tile is called greenware.

Firing of the Greenware

The greenware formed is placed in a roller hearth kiln for firing. The firing process consists of high temperatures and pressure, temperatures reaching 2100 degree F over the course of a 45 minute period. During this process, the tile shrinks up to 15%.

There are two types of firing processes, resulting in two main categories of ceramic tile flooring:

a) Monocottura:

The production time of ceramic tile flooring can be reduced to a matter of hours by the process called "monocottura" (an Italian term meaning "single fired"). In this process, individual ceramic tiles are fired and glazed at the same time. It also produces a denser and more durable ceramic tile. This subset of ceramic tile features a flat back to allow an easier installation.

b) Bicottura:

A similar process called "Bicottura" ("double-fired") breaks the firing process in two phases. The clay is fired once and then again with a glaze added to the top layer of the ceramic tile. In this process, the ceramic tile may be fired several times, and are generally a little less durable than monocottura ceramic tiles. Bicottura tiles should only be applied to indoor locations, mostly as wall tiles and backsplashes because of their softer body and their glaze.

The Finished Tile

It takes about one hour to convert raw material into finished ceramic tiles. However, the time will vary depending on the machinery and material. After all the processes, the finished **ceramic tile** is categorized by color/shade, size and quality. The tiles are than sorted, palletized and packed with the help of machines.

What is Meant by Frost Resistance of a Ceramic Tile?

Ceramic tile frost resistance is defined as the ability of ceramic tile to withstand freeze/thaw conditions with minimal effect. The frost resistance of ceramic tile is dependent on the tile's porosity and water absorption levels.

Frost damage can occur when the variety of ceramic tile absorbs moisture through its pores, causing the water to freeze internally when temperatures drop. Since water expands when it freezes, tension is then exerted inside the body of the ceramic tile. This internal pressure may become high enough to cause cracks in the ceramic tile.

For locations characterized by below zero temperatures at any time of year, you must ensure that you choose ceramic tiles with frost resistance for outdoor installations.

If a tile is not listed as "passed" or "resistant" under one of the following standards, its performance in any area with freezing weather is questionable.

EN 202 Passed - Tile is chilled to -5 degrees C (-23 F) and then rapidly heated to 5 degrees C (41 F). Tile must survive 50 freeze/thaw cycles.

ISO 10545-12 Passed - Identical test to EN 202 with tile subjected to 100 freeze/thaw cycles.

ASTM C1026 Resistant - Tile is chilled to -18 degrees C (-40 F) and then rapidly heated to between 10 to 16 degrees C (50-60 F). Tile must survive 15 cycles of freeze/thaw.

A ceramic tile intended and warranted for outside applications is always tested for frost resistance. The water absorption percentage (WA%) of each ceramic tile is clearly listed on the tile data sheet.

On the other hand, choosing the perfect tile is not the only thing required. Suitable materials for the bedding layer and the grout joints are also an important aspect to provide an inclination that prevents water from pooling. Similarly, frost damage is often caused by a number of other factors. Only a combination of a suitable tile, grout, and other accessories can make tile flooring frost resistant.

Ceramic Tile – The Wide Variety of Usage, Shapes, Finishes, Sizes and Shading

Ceramic tile is not only known for its resistance to various elements and its easy cleaning features. Ceramic tile is also relied upon for the extensive range of usage, shapes, finishes, sizes, and shades it offers. Here is a selected snapshot which demonstrates the versatility of ceramic tile.

Usage

Ceramic tile has long been considered to be a multi-purpose tile and can be used in several areas. If compared to carpet and vinyl which are manufactured only for floors, certain ceramic tiles can be used on:

- Floors
- Walls (interior and exterior)
- Countertops and backsplashes
- Patios
- Fireplaces
- Walkways
- Exterior house trims

Some ceramic tile is usable outdoors, others are for use as indoor tile only. Before purchasing your ceramic tile, let your sales rep know what you have in mind as far as installation.

Shape

Ceramic tiles are available in many shapes like rectangles, hexagons, elongated hexagons, octagons and many more. However, square tiles are the most popular, as these are the easiest to install without too much time planning the layout pattern. Additionally, ceramic tile is offered in a variety of shaped edges such as straight edges, scalloped edges and cushioned edges that are heavily beveled.

Finish

Ceramic tile is also obtainable in various surface finishes that includes: smooth, textured, glazed, unglazed, polished and unpolished surfaces etc.

Size

Ceramic tiles are available in a vast quantity of sizes, according to the individuals needs. Available sizing of the floor ceramic tile ranges from 15x15 to as large as 60 x 60. In case of wall tiles, the most popular sizes are 20 x 40 and 30 x 60, however, there is also a drift towards other sizes. At the time of packaging, manufacturers who mass produce ceramic tile categorize these tiles by size. This allows for a more uniform product, which is appealing to many to achieve a refined look once the ceramic tile is installed.

In the case of certain handmade ceramic tiles, like Saltillo tile for instance, minor differences in the size of ceramic tiles are common. These slight differences can add a lot of dimension to your layout, depending on the look you're after. In many cases, the differences in size can be compensated for with the help of grout lines.

Shade

Ceramic tile is a largely natural product, its colors being determined by naturally occurring elements. The manufacturers of ceramic tile minimize variations in a batch by sorting similarly shaded tiles within cartons. The cartons are also marked with the shade and run numbers.

While a certain degree of shade variation is inherent in all ceramic tiles, many tiles, both glazed and unglazed, are deliberately produced with a wide shade variation. This is done to bring out the natural beauty of the product. It also allows for a certain level of creativity at the time of layout and installation. This type of variation is therefore sought after as a means of making each layout unique.

Monocottura and Bicottura – How Ceramic Tile is Made

A major and important phase of a ceramic tile manufacturing process is the firing step. In this process, the greenware (unfired clay) is placed in a roller hearth kiln for firing. The firing consists of high temperatures, high pressures, and firing cycles. Time in the kiln is varied (depending on the process) and temperature often reache 2100 degree F. In this method, the tile shrinks up to 15%.

Generally, either of the two processes is applied for the phase of firing i.e., Monocottura and Bicottura. A description of both is given below to enable an understanding about the best choice.

1. **MONOCOTTURA:** This is an Italian word meaning "single-fired". It is the newest method used to produce ceramic tile. In this process, individual tiles are shaped, glazed and fired in one step, at the same time. The production time of ceramic tile can be reduced to a few hours collectively by this process. "Monocottura" is an important term to know because many building contractors who buy and install ceramic tile associate this process with quality product. Monocottura is a favorable method for producing durable tiles for flooring. The development of this technology has revolutionized the tile industry, improving the quality of the finished product and making the production more efficient.

   The Advantages:

   - Monocottura tiles are much more durable for use as flooring tile, producing a dense body and a hard glaze for ceramic tile.
   - This process significantly speeds up production, resulting in cost savings for the manufacturers down to the buyers.
   - Previously, tiles were baked in the kiln (oven) for days. Today, with the Monocottura method, these tiles can be produced in less than one hour.
   - Single fired products are produced with a flat back, which makes installation much easier than the old fashion button-backed or lug-backed tiles.

2. **BICOTTURA:** This is an Italian word meaning "double-fired", a similar procedure that breaks the firing process in two phases. The clay body is baked in the first step, and the glaze is applied in the second. In reality, Bicottura tiles may go through the kiln as many as four times. This double-fired method of production has been replaced by the Monocottura method for making floor tiles. The pros and cons of Bicottura tile are as follows:

- The Bicottura method is still considered as the best method when decorative wall tiles with multiple colors are required.
- Bicottura tiles are only recommended for indoor locations, mostly as wall tiles and backsplashes because of their softer body and weaker glaze. They are also produced with lugs on the back making installation difficult for use as a flooring tile.

All about Glazed Tiles

Glazed tiles make up more than half the tiles sold annually in North America. These tiles are made exactly the same way as unglazed tiles, but undergo an additional process. Glaze is a glass wear layer or hard finish, sometimes with added color, applied to the surface of ceramic tiles. They are then pressed in a die and then fired in a kiln to render their hard surface. This process liquefies the glass and fuses it to the bisque, aka the body of the tile. The glaze seals the bisque surface, making it non-porous and being an impervious facial finish, protects tile from stains and moisture. Glazed tiles are easy to maintain and can be treated to make them more slip resistant.

What is glaze?

The term 'glaze' can also refer to the material or mixture from which the coating is made. The glaze, either glossy or matte, provides the color of glazed tiles. These colors are created from a mixture of minerals.Some of the more popular materials used in the creation of glaze are gold, silver, zinc, copper, mercury, and cobalt. On other side, the strength and wear resistance of the glaze is determined by its hardness. The harder the glaze, the better it will stand up to pressure and abrasion. Glaze hardness is determined by:

Kiln temperature - The higher the kiln (oven) temperature is, the harder the glaze will be.

Color - Light-colored glazes are usually harder than dark-colored ones.

Gloss Level - Matte-finished or satin-finished glazes are generally harder. Shiny glazes are usually softer and less durable.

Preferred Usage

Glazed tile is appropriate for uses that range from light residential use to medium commercial traffic.

Vitreous glazed floor tiles are a durable option for counter tops and walls, providing a surface that is practically stain proof.

However, because the non-vitreous ones have a light-duty glaze, they are not suitable for floors and counter tops.

Choose rough glazed tiles for bathroom floors as a highly smooth glaze can become slippery when wet.

With reference to usage, talk with your sales rep with regard to issues of slip-resistance, moisture resistance, foot traffic, and gloss levels of your chosen tile. Also, always be aware of your warranty information with regard to any of the above.

A balance between the practical issues and decorating issues when choosing glazed ceramic tile is the key to the overall success of the installation. It can also contribute to the long life of the glazed tiles themselves. The following factors will guide you about making the right choice:

For areas with heavy traffic: Generally speaking, the higher the gloss, the softer the glaze. Yes, shiny glazes are softer, can be scratched more easily. Glazed tiles can be more slippery than the satin or rustic finishes.

For areas prone to surface soil: Sharp sand, sea salt, or gritty dirt can cause premature wear on the glazed surface. This can be avoided by regular cleaning, taking off of shoes, and use of runners and mats in key access points.

A glazed tile will also reveal the clay body color when chipped. This may be a concern in areas where snow will be shoveled or work with tools is done.

Unless special grit is added to glazed tiles, they can become very slippery when wet. For areas prone to moisture, it's best to use unglazed tiles.

Application:

Glazed tiles are used for both commercial and domestic applications, indoors as well as outdoors.

The glaze layer completely seals the upper surface of the ceramic body, providing the highest level of stain resistance.

Glazed tiles are therefore the easiest to clean and maintain and do not require sealing of any kind.

Due to technological advancements, there are some new glazes on the market that are hard and durable enough for use in heavy commercial applications.

Variety:

Glazing can greatly expand the variety of colors, patterns, and textures in ceramic tiles. Applying several colors and patterns on the surface of the tile through screening technology is the most versatile way to change the monochromatic color and finish of clay.

Glazed tiles are available in almost any color. They also vary in gloss levels depending on the look the manufacturer wants to achieve. It can range from a matte, to a satin, to a high gloss. The appearance varies from rough to smooth and their textures from highly polished to rough.

Cleaning Ceramic Tile

Ceramic tiles are gaining huge popularity among households and commercial sites. Some of the reasons for this lie in the cheaper maintenance and easy day-to-day cleaning offered by many varieties of ceramic tile. Because of its natural composition, and because of how it is made as well, ceramic tile is a surface that is resistant to build-up. Ceramic tile does not retain dust, residues, germs, pollen, liquids; and/or absorb fumes, odors or smoke. Usually, a damp cloth is all that's required in cleaning ceramic tile.

Moreover, tile has little appeal to breeding bacteria, viruses, fungi, molds, and bugs. This enables a very suitable atmosphere for allergy sufferers and also allows for good hygiene. But despite its resistant to build-up and to allergens, cleaning ceramic tile as a part of a weekly regimen is the best way to preserve their natural beauty and original condition.

The hard, nonporous surface of glazed ceramic tile is a naturally low-maintenance finish. This makes cleaning ceramic tiles even more straightforward. Once properly installed, the weekly routine of cleaning ceramic tiles requires little more than dusting and an occasional damp mopping. Common household cleaners can be used to remove more tenacious materials. When shopping for such cleaners, it's a good idea to talk to your local retailer about the best products available for cleaning ceramic tile. These experts can point you in the right direction.

Some rustic tiles like matte or deeply textured surfaces may require more aggressive approach when cleaning ceramic tiles. This includes the usual simple mopping, although it must be taken into account that with unglazed ceramic tiles there is a lack in an exterior outer shell covering. Textured ceramic tile can harbor more grains of sand, or glass particles brought in by way of footwear from outdoors. So, when cleaning ceramic tile of this type, the tendency of the tiles in being vulnerable to grit, moisture and minute dirt particles must be included in your regimen for cleaning them. Use strategically placed mats at entrances to keep sand and other abrasive materials away from the surface of your unglazed ceramic tile. Include the use of a broom or vacuum when cleaning ceramic tile of this kind as well.

Success in cleaning ceramic tile lies in frequent cleaning and subsequent minimization of excessive moisture and dirt on the surface of your ceramic tile for extended periods. Cleaning ceramic tile regularly is the best way to retain its original look and appeal.

Here are a few selected, simple-to-follow guidelines to a trouble-free approach to cleaning ceramic tiles. These guidelines will not only help you in cleaning ceramic tiles and keep them from exposure to dirt and debris, but will also save you the cost of tile replacements.

Initial Cleaning (soon after installation):

The most important procedure when cleaning ceramic tiles is done immediately after the tile has set. This involves the complete removal of grout residue and construction dirt from the newly installed tile application. In many cases, grout residue can be successfully cleaned by scrubbing with a mild detergent, and later rinsing thoroughly. It is important to remove all rinse water through wet vacuuming or dry toweling. Grout manufacturers provide direction for such cleaning, and these instructions should be followed closely.

Regular Cleaning:

Make it a habit of cleaning ceramic tiles on a weekly basis at least. This will help prevent the accumulation of any dirt particles or debris building up on the tile's surfaces.

When cleaning ceramic tiles, always ensure that the cleaning agents you use are suitable for ceramic tile and ceramic tile grout. Detergents in this respect should be of a neutral pH. Avoid using acidic or alkaline solutions. Ammonia, for instance, can decolorize the thin mortar or grout present in the tile itself, thus taking away from its original appearance permanently.

Cleaning Stains:

In the event of ceramic tiles stains, it is always a good idea to rinse the tiles with a solution consisting of a quarter cup of mild detergent mixed with approximately one gallon of water. Use a sponge to soak up the solvent and apply it to the stain-affected areas. Finally, using a dry towel, carefully buff the tile until its shine is once again restored. When purchasing cleaning agents and mixing solutions, always follow the instructions carefully.

For stubborn stains, a paste of scouring powder and water can be applied. The paste must stay in place for 5 to 10 minutes prior to rinsing it off with a nylon pad. Ask your retailer for any specific instructions as to use for cleaning ceramic tiles.

The ease of cleaning ceramic tiles is one genuine reason why the installation of this type of tile is a valued choice. This is particularly true in environments where hygiene is essential. Porcelain tile is widely used in hospitals, food processing plants, water purification plants, restaurants, laboratories, public swimming pools, bathrooms, public restrooms, and many other common locations typified by high traffic, bacterial sensitivity, and moisture.

Grout for Ceramic Tile – Facts & Considerations

Grout for ceramic tile is a cement-based bonding material used for filling joints between tiles. The space left between tiles to be filled is called a grout joint. The grout joint between the tiles is usually very porous, therefore, it needs to be sealed and maintained properly to prevent stains and discoloration. Protected tile and grout for ceramic tile will be easier to clean, more resistant staining, and provide a safer and healthier environment.

Types of grout for ceramic tile:

There are four basic types of grout for ceramic tile: Unsanded, fine sanded, quarry type and epoxy.

1. **Unsanded grout for ceramic tile**: This is used for wall tiles where the grout joint is less than 1/8" wide.
2. **Finely Sanded grout for ceramic tile**: This is used for floor tiles where the joints are 1/8" to 3/8" wide.
3. **Quarry-type grout for ceramic tile**: This is the same as finely sanded grout for ceramic tiles except that a coarser grade of sand is used. The quarry-type grout for ceramic tile is used for joints that are 3/8" wide to 1/2" wide such as those used with Saltillo tiles.

4. **Epoxy grout for ceramic tile**: This consists of an epoxy resin and hardener. Epoxy grout for ceramic tile is highly resistant to stains and chemicals and has a tremendous bonding strength. It is ideal for countertops and other areas susceptible to stains.

Some important considerations when choosing grout for ceramic tile:

The wider the joint, the coarser the sand has to be. The sand prevents the grout for ceramic tile from shrinking and cracking.

Grout for ceramic tiles comes in a wide variety of pre-mixed colors.

The standard size of wall joint is 1/16" wide.

The standard size of grout joint for floor tiles is 1/4" wide (finely sanded).

Because floor tiles may vary slightly in size, grout joints in the floor tiles should not be smaller than 3/16". The installer will not be able to keep a straight line if the joint is too narrow.

Impregnating sealers go into the grout joint and protect against water and oil-based stains.

To prevent or limit staining problems in grout for ceramic tile, latex additives or a sealer is recommended. The latex additive forms a rubber-like film over the pores in the grout for ceramic tile, thus limiting its tendency to absorb stains. However, it is not completely stain proof.

Sealers for Ceramic Tile " Facts & Considerations

A sealer is a liquid coat applied to the porous surface of the tile or grout, to protect them from oxidation, natural deterioration and day-to-day wear. Typically speaking, sealers are used to protect unglazed tiles and grouts from absorbing stains. Take a look at these guidelines, which are meant to get you started when it comes to choosing the right sealant for your ceramic or porcelain tile project:

Types:

There are two types of major types of sealers for ceramic tile or porcelain tile:

1. **Penetrating Sealers:** These are absorbed into the tile or grout, forming a stain resistant shield just below the surface. Most penetrating sealers will not change the appearance of the tile.
2. **Surface Sealers:** These are coated on the top of tile and grout, forming a non-porous, stain resistant sealant. The surface sealer will enhance the rich natural colors of the tile and adds a slight luster as well.

Important Considerations:

The surface of most ceramic and porcelain tiles does not need to be sealed, although some require a light application of a penetrating sealer to fill the micro pores on the surface of the tile.

However, all unglazed tiles including dense porcelains, should be sealed prior to grouting. It will prevent the grout from staining the tile, especially when a dark colored grout is being used with a light colored tile.

Impregnating sealers go into the grout joint and protect against water and oil-based stains.

Highly absorbent tiles such as hand made Saltillo tiles must be permanently sealed with either a penetrating or surface sealer.

Use only penetrating sealers on dense, unglazed tiles such as quarries or porcelains.

It is important to follow your distributor"s recommendations as well as reading the instructions on the product being used.

The above information is a selected set of guidelines. It"s a good idea to ask the experts about which type of sealer performs best for the type of tile you have for further details. If color change is a concern, or staining resistance, then these are the questions to put to your seller. Talk to your ceramic or porcelain sales rep, or your local retailer about the latest products for sealing ceramic tile or porcelain tile. Ask about whether penetrating sealers vs. surface sealers with regard to your specific tile and aesthetic expectations " find out which is the best fit for your project.

Shade Variation in Ceramic Tiles

Many popular styles of ceramic tiles are designed and manufactured to appear and feel like natural stone, imitating their rugged surface and color variation. It's important to understand these variations while selecting and laying out your ceramic tile flooring. You will always be provided with a wide range of glazes, different gloss levels, colors and texture variations to choose from. Your choice should depend on the conditions present at your chosen location, whether commercial or residential.

A commonly preferred choice is a solid color tile because of its consistent look. However, shade variation is a natural factor in all fired ceramic products. In fact, certain tiles will show a certain amount variation even within their dye lots.

For the benefit of better understanding on the part of the consumer, shade variation categories have been devised to enable consumers choose their desired shade spectrum. These shade variation ratings are mentioned on the back label of each sample within either of the low, moderate, high or random categories. Here is a brief explanation of these categories:

Low: Consistent shade and variation

Moderate: Moderate shade and texture variation

High: High shade and texture variation

Random: Very high shade and texture variation

The color of the tile's body is determined by the color of the clay used to manufacture it. It is usually the clay available in the surrounding regions of the manufacturing facility or sometimes imported from another region. You can have a look at the body of tile to find out if the color is red or white. The quality, however, depends on the processing standards of the manufacturers rather than the color of the body.

Color variations will also be present within the manufacturer's samples of tile of the same color. Moreover, it can be seen throughout the installed tiles on countertops, walls and floors.

If you have a particular tendency towards color consistency, then understanding the facts and talking to your tile seller about your expectations can be a worthwhile pursuit.

How to install ceramic tile flooring

Ceramic tile, if chosen intelligently and installed correctly, protects and beautifies any surface it covers. It has lasted for centuries on facades and paving areas throughout the world. The variety, style, and endless color selection of ceramic tile has a guaranteed place as a high-end finishing material. Additionally, ceramic tiles are fairly easy to install, if done with the proper planning and preparation. And a do-it-yourself tile installation can save you money too.

The following is first in a series that explains the detailed procedure when looking to install ceramic tile flooring. This will help you install a new ceramic floor or replace an old one.

First of all, making a plan for your ceramic tile flooring is the best means of achieving long-term success. With a good sense of how you want your floor to look and function along with other structural elements, installing ceramic tile flooring will make sense to your space in every way. Taking these other elements into account is the first step to consider when looking to install ceramic tile flooring. The first thing you should do is to draw a floor plan of the room. This plan should include all the details and information, especially things that are NOT directly involved in the project: for example, doors, cabinets, toilet, and electricity supplies, among others. From this point, you will be ready to consider the following in detail:

1. Evaluate the size of the room to be tiled. Measure the room from one wall to the opposite wall. Now, similarly measure the opposing walls to calculate the square footage of your chosen area. This area is important to note, as it will tell you the number of tiles to purchase to cover that area.
2. Think about the size of your chosen tile. The number of tiles you need will obviously depend on the size of the tile you wish to lay. Also, the tile pattern you will like on the floor may be a factor in considering how many square feet of ceramic tile you will need to order.
3. If the room is not a perfect 'square' because of an irregular floor plan, do not include this space while taking initial measurements. It will be difficult to locate the center of the room if you include this space. The procedure to factor this space for tiling can be done separately.
4. Select your ceramic tile type, size and pattern. Environmental factors and expected usage demanded upon the type of tile you have in mind should all be accounted for when making your choice. There is also a wide range of sizes in tiles to choose from. Some common sizes can range from 6" x 6" to 13" x 13" and 24" x 14", and many more in between and beyond.
5. Remember to talk to your sales rep with regard to expected and acceptable damage which is often a reality when ceramic tiles are damaged during shipping. Seek advice on how many additional square feet should be ordered to account for this.
6. Selecting the tile color will be followed by the grout selection process. Grout is the cement-based filler or bonding material used for filling joints between tiles. There is no certain rule about the combination of tiles and grout and their color variance. Variation in color will be a reality. So in a pinch, choose your grout for practical reasons above aesthetic ones. Ordering samples of your chosen ceramic tile is a great way to get the best match for color. But for practicality in applying the grout, and maintaining it afterwards it's a good idea to talk to your seller. Also, read all product instructions and make sure you follow them closely.

One thing to think about when looking to install ceramic tiles as flooring is that you will be changing physical makeup of your interior or exterior. This means that certain preparatory steps need to be taken to ensure your success when you install ceramic tile. Overall, it is important to prepare the room or outdoor area for the installation. It is also important to see to your batch of ceramic tiles for any damage or other warranty-related issues. It is important to make sure that any physical obstacles are removed, and that any issues in general are resolved before your start laying ceramic tiles in your chosen location. Here are a few things to think about before you're ready to install ceramic tiles.

Preparation:

Always inspect tiles upon delivery or prior to installation.

Ceramic tiles are stable flooring materials, but you should keep them in the room for at least 24 hours before installation to equalize the temperature of the tile and the subfloor.

The floor on which ceramic tile is being installed should be fixed soundly. If you jump up and down on the floor and it moves, the first thing you need is to stabilize the subfloor. This can be done by screwing or nailing it to the joists.

Also check if the floor is flat. If not, it may be necessary to install a plywood or masonite underlayment. On concrete floors, make sure all paint, grease, and any other materials are removed. You might have to lightly sand the floor to remove any excess paint. High spots can be removed with the help of a hammer and chisel.

Remove all baseboards and/or trim. Number the baseboards if you are removing them so that it is easy to locate and reinstall.

Check the doors for clearance. If you are installing thick tiles, the doors may need to be trimmed. The easy way to check it is to stack two tiles on top of one another and sliding them under the door. If the door does not swing freely over the stacked tiles, trimming the door may become necessary.

To install ceramic tiles outdoors, it is necessary to use tiles which absorb less than 0.5% water, "fully vitrified" according to international standards. Always double-check this type of information with your sales representative, and be sure that you both are aware of your intended application versus the durability of the chosen tile.

Most importantly, make sure you have a clean and dust/dirt free floor. Clean the floor thoroughly, removing all loose debris and dirt to enable a robust adhesion and surface contact between the subfloor

and tiles. In order to prepare your area for installation, cleaning is the most important step. If there is no tile on the floor, simply mop or scrub the floor to clean it and remove any grease or wax build up. If the surface is uneven, it must be sanded to level it. For an already tiled floor, remove the previous tiles, sand or scrap it until it is smooth. Your surface is now prepared for tiling.

When looking to install ceramic tiles, looking to the above points is an absolutely necessary step before you begin to lay down the tile. Good preparation will save you a lot of headaches later on!

At this stage, you've ordered and received your choice of ceramic tiles, having communicated with your sales rep as to which ones will be the most suitable for your install. Ceramic tile experts can tell you thatthe best way of getting the best results is to be prepared. A well thought out floor plan is of course essential. And a good knowledge base when approaching the vast selection that ceramic tile presents is also a key to success. But the basic step of making sure that the right tools are on hand can be a real time saver. And saving time will make your efforts in installing ceramic tile flooring even more rewarding!

Before you consider the best way to install ceramic tile flooring, here is a basic list of items you need to consider:

1. The right number of ceramic tiles - both full and trimmed that match your floor plan for square footage
2. Tile Spacers
3. Setting material- thin set, mastic or adhesive
4. Sanded grout for grout joints over 1/8 inch.
5. Non-sanded or wall grout for joints
6. Tile adhesive or "mastic"

Additionally, you may wish to consider keeping the following tools on hand in order to make sure your efforts to install ceramic tile flooring will be as efficient as possible:

1. A level
2. Rags to keep grout and adhesives from sticking to the surface of your ceramic tiles
3. Several large sponges
4. Bucket (with warm water)
5. A notched trowel
6. Grout float
7. Rubber mallet
8. Hammer
9. Safety glasses
10. Knee pads for floor work
11. Tile cutter- these can be rented
12. A square
13. Tile nippers
14. Pliers
15. A tile saw or a tile scorer
16. Putty knife
17. Tape measure (or digital laser tape)
18. Chalk line
19. Pencil

In keeping with the idea that a good installation relies on getting the basics right, looking to your substrate is the next major consideration. The substrate is the surface or medium that serves as a base for tile flooring. It is a term used to describe the subfloor, subwall and subcountertop. The term can be extended to a concrete subfloor, or an existing floor over which the ceramic tile is to be installed. Either way, when looking to install ceramic tiles as flooring or even as wall tile, a clean, level surface is an absolute must. When installing ceramic tile on an uneven surface, you risk the possibility of allowing the ceramic tile to crack or loosen. As such, it is worth your while to spend some energy and resources on making sure that your substrate will support your installation.

In some instances, ceramic tile will be installed on a new substrate. Installing ceramic tile flooring on a new substrate adds extra dimension to the procedure. There are a few elements to consider in a case like this. Preparing a good substrate is the most important step in ensuring a beautiful tile installation.

General Requirements:

New concrete subfloors must be left to cure 28 days before tiling.

All floor and wall substrates must be rigid. Any spring in the substrates may crack the tile.

All substrates, particularly floors, must be structurally sound.

All substrates should be level.

All substrates must be completely free of surface adherents such as oil, grease, dust, loose or peeling paint, concrete sealers or curing compounds. If these elements are not removed, the tile will not adhere properly to the substrate.

Suitable Substrates

Suitable tile subfloors include those that are structurally sound and free of excessive movement. They include:

Concrete which has been allowed the appropriate curing time

Terrazzo or natural stone

Other varieties of ceramic tile

Non-cushioned vinyl and linoleum

Cement backer boards

Double layered plywood (exterior grade) combined 1 1/4"

Unsuitable Substrates

Unsuitable substrates for tile are those that tend to flex, expand, contract or warp. Any excessive movement will loosen the tile and pop the grout. These substrates must be replaced or covered with a suitable underlayment. Unsuitable substrates may include:

Cushioned vinyl

Perimeter installed vinyl

Single layered plywood

Flake board

Particleboard

Chip board

Hardwood (strip) flooring

Luan plywood

OSB boards

Masonite

Sheet metal

Your substrate is an essential element to your efforts in installing ceramic tile as flooring. Keeping the above in mind may save you time and money later on in the process.

At this juncture, you've prepared your floor plan, made sure you've got the right tools on hand, and ordered your chosen ceramic tile. Once your batch of ceramic tile has arrived at your site, you've let it acclimate that is, you've allowed it to expand and contract along with the subfloor in the environment where it is to be laid. At this point, you are ready to actually install ceramic tile flooring in your chosen space! It s the moment you ve been waiting for! Here are some initial steps to make sure things continue to go smoothly:

1. **Find the center point:** Once you ve consulted your plan and confirmed the measurement of the space, find its center point. Finding the center point is critical for laying the tile as it helps you determine where to lay your first tile along with the ones that will follow. You can find this center point by drawing lines from the mid points of all the floor walls. These lines will intersect each other at a single point in the mid of the room (in case of a square or rectangular room). This point will be your center point and it will divide your floor into 4 equally sized quadrants.
2. **Tile laying "dry run"** Lay your tiles as a "dry run". Think of this stage as a sort of "rehearsal", in that you'll be laying down the ceramic tiles without adhesive to make sure they fit together as planned. Starting at the center, lay out the tile pattern by on the floor, placing the first tile at the corner nearest to the center point. You will work in one quadrant at a time. Begin placing tiles in a straight line towards either wall, leaving a small space in between the tiles. Later, when you are laying tiles with adhesive, you will use tile spacers to provide uniform joints between your tiles. For now, leave a space approximately the size of the tile spacers you will use (either inch or inch, depending on your preference for joint size).
3. **Connecting center point and walls:** Once you have laid a row of tiles in one direction, lay another row in the opposite direction, and continue following this pattern until you set the last tile in the corner, kitty corner from the center point.
4. **Cutting Tiles:** To cut the tile, you can use a tile cutter or a glasscutter. While using a glasscutter, put a straight edge along the tile and score the line only once with the glasscutter. Place the tile on the edge of a workbench and snap off the cutoff piece. For complex cuts, you can use a tile saw or tile nippers.
5. **Covering the remaining quadrants:** Follow the same process for the other three quadrants. Once you have laid out tiles on the entire floor, check to make sure that the spacing is ok. For tiles closest to the walls, you will have to either cut them or slightly realign your center point. Most people choose to cut rather than realign, depending on whether or not the bordering tiles will be visible to the eye. However, you can adjust the positioning of the tiles to a reasonable degree so that you end up with as many full tiles as possible. This will avoid excessive cutting.

When all tiles are laid out, measured, and cut, and appear to be to your liking, you are ready to lay the adhesive.

Your plans to install ceramic tile flooring have produced a floor plan which you will use as a guide. The space has been fully prepared baseboards and other accessories have been removed. Doors have been trimmed where necessary to accommodate ceramic tile. The substrate has been cleaned and has generally been checked for stability and evenness. You ve gathered the proper equipment, and have allowed your choice of ceramic tiles to acclimate in the area where they are to be installed. The space itself has been measured, and divided into quadrants after the centre of the space has been verified. The ceramic tiles have been laid down in a dry-run, or "rehearsal" in order to make sure that your tiles will fit together in accordance with your floor plan. At this point, you are ready to prepare for a permanent installation. But, first you must mix and spread the mortar adhesive. Here are the basic steps.

1. Pick up all the ceramic tiles in your batch and set them aside in bunches reserved and marked for the different quadrants of the space.

2. You will need mortar adhesive to set ceramic tiles. Mix the mortar in a large bucket by adding the dry mortar in water and stir it to a consistency of thick paste. You can also rent a power mixer for this process.
3. Once the mortar is mixed and ready, begin spreading it with the notched trowel on your prepared surface. Start from the center point, working only in one quadrant, and apply small sections at a time, following the same pattern you laid out in the dry run.
4. Spread the adhesive evenly. Work in small areas at a time, using the surface area that you can cover when using the trowel while in arms length as a guide. Use the notched trowel in such a way that the rows left in the mortar are in a straight line.

Some varieties of adhesives require added water, while others don't. Please read all directions carefully. Often latex or acrylic is added to mortar adhesive for extra durability. The latex gives the mortar flexibility and additional bonding strength. This flexibility is required for substrates that may experience expansion and contraction due to environmental conditions. The additional adhesion strength is needed while setting tile over hard-to-bond surfaces. However, not all latex and acrylic additives are designed to do the same job. For example, some are not recommended over plywood. If in doubt, always consult your seller to make sure that your chosen mortar is suitable for your specific installation.

At this point in time, you are well on your way to having the ceramic tile flooring you've envisioned for your indoor or outdoor installation. A lot of research has been done on the subject of ceramic tiles for flooring and how to install ceramic tile. After working with your sales rep on which type of ceramic tile is the most suitable to install, you've received your delivery. You've gathered the right tools to do the install. Your ceramic tiles have been removed from their boxes and have been allowed to adjust to the temperature and moisture levels in the space where you are going to lay them down. You've prepared a floor plan for your ceramic tile installation, and you've laid your tile in a dry run. After the "rehearsal" stage of the dry run, the substrate has been prepared, the space has been measured, and the mortar adhesive has been applied. You're ready now to start placing your tiles permanently. When looking to lay down ceramic tiles, here are the basic steps:

1. Set the first tile in place at the corner lines made by the center point, pressing down slowly and firmly. The grooves should neither be too deep nor too shallow. Set tile spacer and continue with the rest of the tiles. Keep setting spacers after each tile.
2. Take a rubber mallet and lightly tap the tile to assure a good coverage. Work in small sections and take your time. Keep an eye on the mortar, if it gets too dry, it may be necessary to add more water and remix. If the mortar adheres to the surface of any of the ceramic tiles, remove it before it dries. Lay all the full tiles first and leave the cut tiles until last.
3. Ceramic tiles, if being installed on horizontal surface, must include a slope for drainage purposes. Generally speaking, a slope of inch per foot is required to provide complete surface drainage.
4. Otherwise, make sure that your flooring is level as you add tiles to each quadrant. Remember that all surfaces have some degree of variation, although you should aim for the most level surface possible. You can adjust each tile in order to achieve a more level surface by moving it or adding adhesive to the floor.
5. Once a quadrant is complete, remove the tile spacers so they do not set into the adhesive. Follow this process for the remainder of the floor.

After the tiles are set, it is usually advised to wait at least one day or overnight to allow the adhesion to dry and cure. After the adhesive has set your tiles on the floor, you can start the grouting process.

Grout is a cement-based bonding material used for filling joints between tiles and is offered in a variety of colors. Generally, sanded grout should be used in grout joints 1/8 inch or larger and unsanded grout may be used in joints less than 1/8 inch.

You can also choose regular, Portland cement-based grout or latex and Portland cement grout. You can use stain-proof epoxy grouts for a better result and less maintenance, but epoxy is very expensive compared to regular grouts. Here are a few more pointers:

1. When purchasing grout make sure to buy enough to cover the entire project. It is a good idea to buy extra for repairs later.
2. Allow the floor to set overnight before grouting.
3. Mix the grout in a small bucket. Add the powder first and then add water to the bucket and stir with a wooden stick. Do not use a paint mixer attached to a drill to stir. This can create air bubbles in the grout.
4. Mix the grout into a thick, yogurt-like consistency. Allow this mixture to set for ten minutes and recheck to make sure it remains to be the same consistency. If not, add more water or additive.
5. While applying grout, you will still be working in quadrants as you were when you applied the mortar adhesive. Apply a moderate amount of grout on your putty knife. Press grout into the joints to an even level with the tile, keeping your knife on an angle. Skim excess grout.
6. You may notice a mild 'grout haze' on your tiles. Use a damp sponge to remove this haze, but make sure you don't press too hard on joints. This works best by using a dry terry cloth towel. Damp mop the floor afterwards. Be careful that you do not dig the grout out of the spaces.
7. When the grout has set for 24 hours, remove the spacers between the tiles.
8. Repeat this process with other joints in the remaining quadrants.
9. To help the grout cure to a solid, resilient surface, mop the floor daily for the first 3 days. Allow it to cure for a full week. Then brush it with a silicone sealer.

Note: Be careful... if you start washing the grout off the tiles too soon, you might wash down the joints at the same time. However, if you wait too long, it is even worse: you will have a very hard time cleaning the tiles. Start washing the tiles to remove any excess grout when the grout feels firm.

After you're done with the grouting and/or caulking, the installation is almost complete. Wait for the entire floor to cure for about a week. Later, you can give it a good mop to remove any remaining grout haze. You may also choose to seal the grout with a sealer to lock out dirt and or grease. But it is best to wait at least 10 days before applying a sealer.

A smart tip to remove excess grout is to frequently rinse your sponge, and use clean water. Also keep several buckets of clean water ready beside the floor.

Your efforts to install ceramic tile flooring have paid off so far. But at this point, there are a few things to take into consideration as you go forward. For instance, your ceramic tile will still need your attention when it comes to things like room temperature and expansion which will affect the life of your ceramic tile floor. Here is a select list of considerations to take into account when looking to address the issue of expansion and general stability of your ceramic tile flooring install:

Expansion

All tiles may expand or contract depending on temperature fluctuations. This can be prevented by including wall joints during tile installation. The wall joints are also known as expansion joints. Including suitable expansion joints throughout the field of tile allows the tile to push against flexible caulking material rather than hard cement grout. Therefore, caulk will prevent or reduce expansion and contraction to a certain extent.

Wall joints

You can choose caulk instead of grout for joints along the walls. There are also other benefits to using caulk along wall joints. The elastic nature of a caulked joint stretches and contracts in response to the tile, preventing buckling and cracking of the tile from the substrate. Color- matched caulking now available from manufacturers allows for next-to-invisible integration of this requirement. Proper usage of either grout or caulk would virtually eliminate cracked tiles and grout.

The impact of extreme climatic conditions or major fluctuations in temperature can lead to cracks in certain types of ceramic tile. Choosing a smaller tile, increasing the number of expansion joints, or selecting a tile with a lower absorption rating will lessen the effects of extreme climate changes and tile color. Before buying ceramic tile, it is always a good idea to talk with your sales rep about the location of your installation and environmental conditions that characterize it. This can help to avoid any post-installation damage to your ceramic tiles.

Removing Stains from ceramic Tile

One of the regular complaints about tile flooring is stains occurring due to kitchen mishaps. These stains can sometimes penetrate the porous finish and become quite difficult to remove. Usually, bleach and other oxidants are used in these cases to remove these deep and tough stains. But in the case of deeply saturated stains and hard water marks, bleach doesn't always work. Consider these options as well:

Hydrogen peroxide

Steam Cleaning (for flooring)

There is an alternate means of removing stains from tile – Diluted Muriatic Acid. Muriatic acid has been regularly used by professionals for decades to treat and remove various types of tough stains from tile and stone surfaces. When used in domestic locations, it is necessary to ventilate the area and to be very careful with this acidic agent. Heavy gloves, eye protection, and mask must be used. Dilute the acid to a 60% acid and 40% water solution. Apply the mixture and scrub the area with a toothbrush or a soft bristle brush. Once the stain is removed, quickly wash the area and discard the remaining mixture in a safe and proper manner.

Replacing the Grout

If a persistent stain appears in your grout, you can try removing it by following the same steps mentioned above. However, for grout stains that can't be removed with a regular procedure, removal of grout from that particular area is recommended. This can be done quickly and effectively by using a small grout remover, which can be bought from any home improvement store.

When the stained grout has been removed, there will be a space that needs to be filled. You can take a grout sample to one of your local stores and try to get the closest match. Once you have the material, pour the dry mixture in the cavity you have created. If the color matches to your liking, vacuum the dry mixture out. Make a small batch of grout by following the directions provided on the box. Use a gloved finger to firmly apply the grout to the damaged area. Wipe the area with a clean and damp sponge.

Replacing Ceramic Tile

Ceramic tiles are rated among the toughest flooring materials available and are not likely to break after being installed. However, accidents may happen. This is specially a case when large floor tiles are installed over a base which is not suitably solid. Also, there may be instances when accessories installed on the tiles leave behind installation holes or permanent adhesive when they are removed. In these cases, replacing the tiles may become necessary. Consider the list below when replacing ceramic tile:

Tools & Materials

Here are a few items you may need to replace ceramic tile:

Drop cloth or other covering

Replacement tile

Grout saw

Cloth or sponge

Safety goggles

Latex gloves

Work gloves

Wall grout

Chisel

Rubber spatula or flexible plastic spreader

Mason's hammer

Large sponge

Stiff putty knife

Water bucket

Wallboard patching plaster, if needed

Grout sealer

Water-based tile adhesive

Procedure:

Take a look at these steps to replace ceramic tiles

1. **Protecting the area:** Lay down a canvas drop cloth or other covering material to protect nearby surfaces, such as floor, tub or countertop.
2. **Removing grout:** It is not always necessary to remove grout from around the damaged tile. But, doing so can reduce the chance of damaging adjacent tiles as you remove the tile. Use a grout saw (a tool with an abrasive grit blade) to do this. Be patient, and work slowly. This is for reasons for safety as much as it is to avoid scratching the tile surface.
3. **Breaking the tile:** Using a chisel and mason's hammer (also called engineer's hammer or hand-drilling hammer), you can break the damaged tile into as many pieces required to remove it. Be careful while applying force to break the tile. It's best to make sure that you don't damage the base material. Always exercise caution when replacing ceramic tile. You must wear safety goggles to protect your eyes from flying chips of tile. Also, wear heavy gloves to protect your hands from any glancing blows with the hammer or from cuts while handling the sharp tile pieces.
4. **Preparing the surface:** Use a stiff putty knife to remove old adhesive or bits of remaining tile. You can apply patching plaster with the putty knife if a hole has appeared in the wall during the tile removal. Any hole deeper than 1/4 inches needs to be filled before moving on to the next step.
5. **Applying the adhesive:** Coat the back of the replacement tile with some water-based adhesive with the help of a putty knife. The coat should be even and not too thick. Talk to your local retailer, or your ceramic tile seller about the latest products to use. And always read the instructions for best usage.
6. **Pressing tile in place:** Press the tile firmly into place while making sure that it is flat and leveled with the surrounding tiles. Use the corner of the putty knife to immediately clean out any adhesive that may have come out between the tiles. Wipe away any adhesive from the face of the tile with a damp cloth or sponge.
7. **Grouting the tile:** The adhesive needs at least 24 hours to cure. After that, follow the manufacturer's instructions to mix the grout and press it into the joints with a rubber spatula or a flexible plastic spreader. Press firmly and move diagonally across the tile joints to ensure they have been completely filled. Usually, sanded grouts are used for floors and unsanded grouts for walls. You can also get samples from the dealers to take home and match your grout color. Once again, always refer to the packaging of any products you buy with reference to keeping products away from exposed skin. Wearing latex gloves is strongly advised when working with grout.
8. **Cleaning tile:** You must not allow grout to dry on the tile surface. After just a few minutes of applying grout, lightly wipe the surface with a large damp sponge. Do not press too hard or you may wipe out the grout from the joints. Rinse and wring the sponge after every pass.

9. **Polishing off the haze:** After waiting for another half hour, buff the surface of the tile very lightly to remove any remaining grout haze.
10. **Sealing the tile grout:** Tile grout is neither waterproof nor stain proof. Therefore, it must be sealed. But you are recommended to wait until at least 48 hours or more after grouting to apply a sealer.

Additional Information of Ceramic Tile

What is a Cement Backer Board? Cement backer board or CBU (cement backer unit) provides a supportive and water-resistant layer between the porous substrate and the mortar and tile applied on top of it. Many ceramic tile installers are now adopting the method where the tile is adhered directly onto a backer board using a much thinner layer of mortar. The backer board is nailed to a plywood or concrete substrate.

What is a field tile? While creating a pattern with different ceramic tiles, the tile used throughout the largest area is called the ﷺfield tileﷺ.

What is meant by Pressing? Pressing is the third and most common step in the manufacturing process of ceramic tile. The clay is pressed and formed/shaped into the shape of a tile. The end product of this step is the green tile.

What is a green tile? The third step in the manufacturing of ceramic tile involves the clay being pressed and shaped into a tileﷺs shape. These pressed tiles are called greenware or green tiles.

What is frit? Frit is part of the glazing process, the fourth step in the manufacturing of ceramic tile. The liquid glaze is prepared from a glass derivative called frit and colored dyes.

What is meant by firing? Firing is the fifth step in the manufacturing of ceramic tile. The tiles are fired in the kiln at temperatures around 2000 degrees Fahrenheit.

What is meant by nominal size of a ceramic tile? Ceramic tile is usually referred to by its nominal size, not its actual size. The tile shrinks during the firing process, by about 10% in size. For example, a 12ﷺ by 12ﷺ floor tile will actually measure 11-7/8 inches square. The most popular sizes are nominal sizes of 13ﷺ by 13ﷺ, 16ﷺ by 16ﷺ and 18ﷺ by 18ﷺ.

What is Bullnose? Bullnose is a ceramic floor tile trim with one rounded finish edge on the tile to give a nice finishing touch. Bullnose is also used as a substitute for cove base.

What is a Corner Bullnose? Corner bullnose is a ceramic floor tile with two rounded finish edges on the tile to be used to complete a corner.

What is sanitary cove base? Sanitary cove base is a ceramic floor trim with a rounded finish top like a bullnose to cover up the body of the tile.

How important is the substrate in a ceramic tile installation? The process for installing a ceramic floor begins with the preparation of the substrate, the base for the tile bed. Common materials used as tile substrates in home installations include concrete, plywood, and drywall. An uneven, damaged, or otherwise unsuitable substrate can seriously affect the life and function of the newly installed ceramic flooring.

What is thickset/mud set? Thickset or mud set is the old method of installing ceramic tile. In this method, a thick layer of mortar was applied to a waterproofed and steel reinforced substrate. This provides a strong, flat base onto which the tile can be installed. It is still an effective but a labor intensive process.

What is a thinset? Thinset is the modern method of applying the tile directly onto a backer board using a thin layer of mortar. The backer board is nailed to a plywood or concrete substrate.

Did you know? Bisque or ﷺBiscuit Bodyﷺ is the body of a ceramic tile. When you look at a glazed tile from the side you can see two layers. The body of the tile, or the thickest layer, is called the bisque. The top layer is called the glaze.

What is Paver tile?

Paver is a natural clay or porcelain tile having a facial area of six square inches or more and made from the dust-pressed method.

What is Quarry tile?

'Quarry tile' is a traditional term for single-extruded, natural clay tiles with a water absorption level not exceeding 6%. It's produced by the extrusion method from natural clay or shale, with properties similar to red stoneware and usually having six square inches or more of facial area.

The body of this tile is both thick and dense, making it ideal for both heavy commercial and residential installations. Their surface generally has good slip-resistant qualities. Quarry tiles are often terra-cotta in color and are used for both floors and walls. They are normally used indoors.

What is meant by Coefficient of Friction of a tile?

This is the degree of slip resistance used to determine different aspects of slippage on a tiled plane. A coefficient of friction of 0.5 and above is the recognized industry standard for a slip- resistant floor. The different aspects include wet and dry conditions, speed of subject, required force to move subject, and critical angle of tiled surface. Area, usage and maintenance directly affect a tile's coefficient of friction

What is meant by fire resistance of a tile?

The ability of a tile to withstand the effects of flame. Ceramic tiles are fireproof and will not feed a fire or release toxic emissions. This makes ceramic tiles a useful structural element to any property.

What is a Buttonback tile?

Tiles with projections on the bondable side are called buttonback tiles. Many of these projections are round and so the term "buttonback" has become famous. Some projections are of different shapes and depths besides the button-like projections usually associated with the term.

What is Saltillo Tile?

A very popular handmade tile is the Saltillo tile from Mexico. Saltillo tile offers size, shade and texture variations from one tile to another, which can add visual flair to an installation. Occasionally, they will even be marked with animal tracks. This is due to the fact that Saltillo tiles are dried in the desert before they are baked in the kiln. On their travels, the animals walk across the tiles, leaving their prints as decorative additions to the surface of the tiles! The effect of Saltillo tiles is one of rustic beauty. These handmade tiles are very porous and must be sealed and waxed to prevent staining and wear. Saltillo tile is not frost-resistant and can not be installed outdoors in regions that are prone to intemperate weather

What is a Terra-Cotta, or Cotto tile?

Sometimes referred to as Cotto, this variety of ceramic tile is used mainly on interior floors. Terra-cotta tile a hard-baked tile of variable color and water absorption. Usually unglazed, this product requires a sealer to prevent staining. Terra-cotta tile is either handmade or machine- made. Handmade terra-cotta tile, similar to Saltillo tile, is usually restricted to indoor use in regions that are not temperate to tropic all year round.. However, the machine made terra-cottas are much denser than the handmade tiles and can be installed outdoors as they are frost-resistant. Terra-cotta offers a handcrafted look with a lot of character. They do however require a little more maintenance.

Which adhesive should I use ﷺ gray or white?

A gray thin set mortar is recommended if you want to use a dark colored grout, while a white thin set mortar is more appropriate if you want to use a light colored grout.

When I choose a trowel, what size notch should I go for?

It depends on the tiles you use for the job. If the back of the tile is flat, a 1/4 inch notch should be enough.

Does ceramic tile feel cold on the feet?

No. Ceramic tile is a thermally retentive product that maintains an even temperature. The tile stays pleasantly cool in the summer and warm in the winter.

Does ceramic tile feel hard underfoot?

The surface of the tile is naturally harder than carpet but not harder than vinyl or wood. Its surface construction is designed for comfort underfoot.

What are the types of grout and what is their specified usage?

There are four basic types of grout:

1. **Unsanded Grout:** This type of grout for ceramic tile is used for wall tiles where the joint is less than 1/8" wide.
2. **Finely Sanded Grout:** This tile grout is used for floor tiles where the joints are 1/8" to 3/8" wide.
3. **Quarry-type Grout:** This is the same as finely sanded grouts except that a coarser grade of sand is used. The quarry-type grout is used for joints that are 3/8" wide to 1/2" wide such as those used with Mexican tiles.
4. **Epoxy Grout:** This consists of an epoxy resin and hardener. Epoxy grout is highly resistant to stains and chemicals and has a tremendous bonding strength. It is ideal for countertops and other areas susceptible to stains.

What are the types of sealers?

1. **Penetrating Sealers:** These are absorbed into the tile or grout, forming a stain resistant shield just below the surface. Most penetrating sealers will not get dark or change the appearance of the tile in anyway.
2. **Surface Sealers:** These are coated on the top of tile and grout, forming a non-porous, stain resistant sealant. The surface sealer will enhance the rich natural colors of the tile and adds a slight luster as well.
3.

What is mortar?

The setting material used to bond tiles to a given surface is called mortar. Different types of mortar are available for different backing and conditions.

What is the mortar bed?

The final coat of mortar on a wall, floor or ceiling is called a mortar bed. It is the layer of mortar on which tile is set. This is also referred to as the installation bed.

What is the mortar joint?

Joint composed of, or embedded in, cement mortar is called mortar joint.

Will ceramic tile chip and crack?

Once installed, ceramic tiles become a permanent part of your structure, and will not chip or crack unless hit with a heavy object. However, prior to installation, it is a very brittle product and can be easily cracked, fractured or snapped, if handled carelessly.

What is meant by chemical resistance of tile?

The ability of a tile surface to withstand damage from chemicals, acids, alkalis and swimming pool salts in accordance with ISO testing methods is termed as chemical resistance.

What is matte glaze?

Glaze that produces a non-shiny finish is known as matte glaze.

What is meant by bisque?

Bisque or 'Biscuit Body' is the body of a ceramic tile, made by a refined mixture of clay, minerals, water and additives - shaped and fired (unglazed) in the kiln. These raw materials also give the bisque its strength and stability.

The strength of the bisque is determined by its density. The strongest bisques (suited for heavy commercial installations) have the smallest and least number of air pockets. The density of the clay also determines if the tile is suitable for outdoor use. Porous tiles i.e., those absorbing more than 3% moisture will freeze and crack if installed outdoors in cold climates

What is ISO?

ISO is the abbreviation of International Standards Organization, a worldwide network of the national standards institutes of 157 countries. It has also drafted international standards (ISO/TC 189 "Ceramic Tiles") for ceramic tiles. ISO Standards are used by tile manufacturers worldwide.

What is an impervious stoneware tile?

Dust-pressed ceramic tiles with water absorption levels less than 0.5% are known as impervious stoneware tiles. They also have high mechanical and chemical characteristics. Also known as Fully Vitrified Stoneware or Porcelain Stoneware, these tiles are often recommended for exterior installations.

What is meant by tile finish?

Finish is the textural or visual characteristic of a tile surface. For glazed tile this may be bright or high gloss, satin or matte. Also, for both glazed and unglazed tiles, the finish can be flashed, textured, polished, raised, embossed, dimpled, etched, scored, ribbed etc.

What are single-fired or Monocottura tiles?

Monocottura is an Italian word meaning "single-fired". In this method, individual tiles are shaped, glazed and fired in one step, at the same time. These tiles are also known as Monocottura tiles. They may be glazed or unglazed. Single-fired tiles are much stronger, with better glaze adhesion.

What are double-fired or Bicottura tiles?

Double-fired or Bicottura tiles are glazed ceramic tiles produced by means of a procedure that breaks the firing process in two phases. An initial firing of the shaped raw materials produces a hard tile body or bisque and then a re-firing of the bisque takes place once the glaze or decoration has been applied. Usually, there are two glazes on the tile, first a non-transparent glaze on the body, then a transparent glaze on the surface. Double-fired tiles have sophisticated finishes with deeper shine and sharper colors.

What is extruded tile?

Extruded tiles are formed by a process in which the wet clay or plastic raw material is forced through a mold and then cut into shape before firing. These tiles are less dimensionally consistent than pressed tiles. Extruded tiles include rustic styles such as terra cotta and clinker. These tiles are often used outside or where a rustic effect is wanted

Extruded tiles are further classified as Precision or Natural based on technical characteristics relating to dimensional and surface qualities.

Single extruded tiles are produced in a long slab, which is then cut to shape.

Double-extruded tiles, also known as split tiles, are produced in a column that must be split before tiles are cut.

What is meant by dust-pressed tiles?

Dust pressed tiles are formed by the dust pressed method in which the finely grinded clay and raw materials are shaped in molds at high pressure before firing. Dry-pressed tiles are consistent with regard to their overall dimension. This method is also efficient and cost effective.

Unglazed Tiles

Advantages:

Because the surface color and pattern is carried through the entire dimensional thickness of the tile (through-body composition), chipping will not alter the tile's color and the appearance will not change as the tile wears.

Many unglazed impervious tiles comparable to natural stone for structural strength, including granite.

Unglazed tile has superior strength for both heavy commercial as well as residential use.

They provide the highest level of scratch resistance against heavy wear and abrasive elements.

Their rugged surface texture and matte finish gives them good "slip-resistant" qualities for use in high-traffic areas and locations known for excessive moisture.

Unglazed tiles are fireproof, and provide an overall fire-resistance to any interior.

Variety:

This variety of unglazed tile includes quarry tiles (extruded), paver tile (dust or dry pressed), encaustic and geometric tiles. Saltillo or terracotta types of tiles may also fall within the unglazed tile category. All unglazed tiles provide a certain aesthetic value, with unique visual effects from variety to variety.

Cleaning:

Once sealed, cleaning unglazed tiles requires only occasional mopping.

When maintenance is needed, a simple vacuum can remove gritty particles. You can also damp mop or sponge with only water or a diluted solution of water and plain detergent.

For a more thorough cleaning, scouring powder paste can be used. Allowing it to stand for five minutes, scouring with brush and later rinsing it dry are all that is required.