CHOOSING BETWEEN PORCELAIN AND CERAMIC TILES

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Don’t bang your head against a brick wall

Refurbishing your floors can be tricky, and deciding on the correct floor tile quite challenging.

The ideal floor tile should meet the required performance criteria – safety and comfort, resistance to staining, and ease of maintenance. However, wear resistance is the most important factor, and the amount of foot traffic should be taken into consideration before making the final decision. Porcelain and ceramic tiles are both part of the larger category of tiles called ceramics. This is a category that includes products made from natural clays hardened by heat and pressure. The terms porcelain and ceramic are often used interchangeably, therefore, not all consumers know how to differentiate between the two.

A night out on the tiles

The history of ceramic and porcelain tiles

The English word 'ceramic' comes from the Greek word *keramos*, meaning pottery. The ancient history of clay tiles, and specifically ceramic tiles, dates back to about 4000 BC where the earliest use of decorative tiles were found in Egypt. The Assyrians and Babylonians also made tiles, with the Romans and Greeks preferring decorative tiles. By 1000 BC, the technology of tile manufacturing had been well established in several parts of the world. Porcelain tiles date back a long way in history, originating in China where they were often referred to as white China. As its popularity grew through the ages, porcelain became very common, and many countries began manufacturing it. In the Western world, porcelain tiles date back to the 1700s where they were commonly used in religious buildings.

Don't have a loose tile

The characteristics and composition of ceramic versus porcelain tiles

Ceramic tiles

Ceramic tiles are a mixture of red, brown or white clays and other natural materials, fired with a designer layer of glaze. They are generally not classified as full-body tiles due to the chemical composition of the clay backing and top glazed layer that differ from one another.

Processing the clay composition to create the solidified product involves lower temperatures compared to the extremely hot temperatures used when manufacturing porcelain tiles. The temperature used in the manufacturing of ceramic tiles generally does not exceed 898°C.

The top layer of glaze is fired on the clay backing, and this highly glazed designed surface can be finished with a high-gloss or matte finish. The tiles range from light to high traffic applications, depending on the density of the clay backing and the thickness of the top glazed layer.

It should be noted that there are full-body clay tiles baked at a higher temperature; these tiles are often referred to as terracotta or quarry tiles that are usually brown, red or cream coloured, according to the colours being used, and are generally used for heavier applications, such as industrial kitchens. It is referred to as unglazed ceramic tiles.

Porcelain tiles

With porcelain tiles, the primary ingredient in the composition of true porcelain is an exceptionally fine, pure, kaolin clay mixed with notable levels of quartz and feldspar. Once the mixture is ready, it is moulded and pressed into the desired shape and fired at an extremely hot temperature ranging from 1204-1371°C to eradicate almost 100 per cent of the moisture that causes vitrification. The end result is a very dense, fine-grained, hard-wearing product with waterproof properties.

There are two types of porcelain tiles – unglazed and glazed. Unglazed porcelain tiles have no glaze, and the colour of the tile can be seen all the way through the body of the tile (through body or full-body tiles). Scratches are therefore less obvious. These tiles can have a polished, semi-polished, matte or even a slip resistant surface. Semi-polished or polished porcelain tiles are not glazed but are polished after the firing process. The polished tiles tend to have microscopic pinholes that are prone to dirt collection. Nano treatment is used to make the tiles dirt and stain-resistant and consists of applying two different compounds of up to ten layers deep to the surface of the tile. Polishing between each application takes place and then the tile is fired again at 1250°C. Glazed porcelain tiles are subjected to a second firing process when a protective coating of liquid glass is fired to the tile. These design layers can imitate any design e.g., wood, rubber or natural stone.

As thick as a brick

Rating ceramic and porcelain tiles for durability

There are a variety of methods used in rating the durability of tiles. The Porcelain Enamel Institute (PEI) rating is a quick and easy way to establish whether a tile is suitable for a specific application. Tiles are rated in five groups or classes, according to their suitability in terms of quality and performance. For instance, a tile with a PEI of 0 or 1 is a light-duty class and is suitable only for wall tiles.

It is likely to crack when used for floor tiles, compared to a PEI of 5 rating where the tile will be suitable for heavy foot traffic in commercial applications. Not all manufacturers use the PEI ratings for tiles but will use some form of indication on the durability of the tile equivalent to the PEI rating, e.g., light traffic (PEI 2); light to moderate traffic (PEI 3); moderate to heavy traffic (PEI 4), and heavy traffic areas (PEI 5).

Scratch the surface

Assessing durability, quality and price

While both porcelain and ceramic tiles fall within the generic ceramic flooring category, there are fundamental differences between the two. Porcelain tiles are made of finer and denser grade clay than ceramic tiles, are pressed and baked for longer and fired at higher temperatures. This results in a product that is harder and less pervious to water than ceramic. In fact, it is the lower water absorption rate (<0.5%) that is the key defining characteristic of a porcelain tile.

Typically, a porcelain tile will receive a PEI rating from 3 to 5, and a ceramic tile a PEI rating of 3 and under. Full body (through body) porcelain tiles are known for their outstanding durability; therefore, they have no PEI rating, which describes how resistant tiles are to abrasion. However, glazed porcelain tiles gain a PEI rating depending on how appropriate the tile is for a specific area.

Porcelain tiles are rated for more heavy-duty applications due to their density and hardness, compared to ceramic tiles that are generally used for wall tiles or light-traffic areas. Overall, a ceramic tile costs approximately 40 per cent less than a certified porcelain tile. The exception occurs when the higher end of the ceramic price range is reached and where there is less of a cost difference for the porcelain versus the ceramic tile.

Still not sure how to differentiate between the two tiles?

Do your own DIY testing to establish which is which. Remember, ceramic tiles absorb more water and a drop of water placed onto the side of the tile will give you a clear indication. The drop of water will be absorbed in a minute or less if it is ceramic, whereas the water will remain on the surface for a much longer period or until it evaporates, if it is porcelain. Porcelain tiles will weigh more than a ceramic tile of the same size due to the density of the material used. It is also much easier to cut or drill through a ceramic tile. If a tile is described as polished, it is most likely a polished porcelain tile. Inspect the side of the tile, or a cracked or chipped tile — if the colour and pattern on the surface is the same throughout the entire thickness of the tile, it's probably a full-body (through body) porcelain tile. If you see a clay backing, it is definitely a ceramic tile. Lastly, check the price. If a tile is 40-60 per cent more expensive, you can bet that it is a porcelain tile. If you are still unsure, ask for the Porcelain Tile Certification.

Porcelain tile certification is key

Even the most experienced eye will struggle to ascertain if a product is porcelain just by looking at it, especially if it is already installed. Therefore, the TCNA (Tile Council of North America) and the Ceramic Tile Distributors Association (CTDA) jointly established the Porcelain Tile Certification Agency (PTCA) to provide a means for manufacturers and distributors to prove that their products comply with the criteria for porcelain tiles. Look for the PTCA logo when you invest in porcelain to have peace of mind that the product you invest in will meet the stringent 0,5 per cent or less water absorption requirements.

Before making your final decision, take all the above mentioned factors into consideration and remember to look at the life cycle costing of your investment.

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