Ceramic Tile
History

- During to more than 6000 years ago, the tile industry went through several stages, which led to the development in the processes of production. Ceramic tiles industrial is one of the oldest and the most famous type of tiles.
Ceramic tile is one of the most durable floor and wall materials, that easy to care for it and available in hundreds of styles, wide variety of shapes, sizes and colors.
• Ceramics

Is a tile made of clay, by subjecting it to burn under high temperatures, then fat his face with a layer strong quartz or basalt, the thickness of this layer thin, very often, so a value of neglected relative to the thickness of the tiles. We have several dimensions of the ceramic lowest (10 * 10).
Manufacturing

• The basic material for the manufacture of ceramic tiles is clay. They are formed in molds and in this case, the so-called green pottery.
Mixing clay with clay shale and gypsum with some other elements such as sand, feldspar, kalkspar. That these materials added to strengthen the clay and reduce the rate of deflation and contraction.
- Row materials → mixing with water → form green pottery → burning → biskute → refine → basic ceramics
The main stage of processing:
1. preparing the mixtures
2. the stage of formation of clay
3. stage drying
4. Burn
• Burning tiles (tiles roasting):
The basis of body biskute tile.
Is burned tiles (ceramic green) after its
furnaces once or more than once and the
number of times burning determine the
degree of purity of the product
range from the temperature
of burning tiles green of 482 °c
to 1370 degrees Celsius the
temperature of the burning
idealism of the tiles are ranging
from 1037 ° C to 1204 degrees Celsius.
• **Temperature**

  Ceramic is cold when used as flooring and can be quite uncomfortable during wintertime in colder climates. (Because of the density of ceramic, it takes longer to heat or cool than other flooring materials).
• **Hardness**
  
  • While most consider the hardness of ceramic to be an added value, there is also a downside.
  
  • Because the ceramic material has no flexibility, the ceramic itself is more prone than other floor types to surface cracking when heavy items are dropped.
• **Durability**
  
  - Ceramic tiles are very durable and lighter than porcelain or real stone tile flooring. Properly installed, ceramic flooring will last for 20+ years.
• Suitability
  • Ceramic flooring is very easy to maintain. It is smooth and non-porous. Because of its durability and its resistance to moisture
Technical characteristics

1. Water absorption: Zero - 2%
2. Density: 2.25 - 2.35 g / cm³
3. Resistance to bending: 300 to 350 kg / cm²
4. Glazed surface hardness: 6 to 9 degrees hardness
5. They are water and bacteria resistant.
**Thickness**

- The thickness of 6 mm for the interior walls.
- 8 mm for floors.
- 10 mm for external walls.
Sizes

- There are many sizes of ceramic tiles which different due to different manufacturing company's and them design.

Ex. (10*10), (45*45), (15*15)
Maintenance

- While ceramic is fairly easy to maintain, the grout lines between the tiles are susceptible to stains, mold and mildew and must be periodically sealed to maintain the integrity of the grout lines. In addition, ceramic in wet areas may require caulking where the ceramic meets another construction material, and the caulk will need to be replaced when it no longer seals the seam due to aging or cracking.
Uses

• It is extremely versatile and so can be used in almost any room in the home.
• It is most often used in bathrooms and kitchens.
• It’s not prefer to use in ( public building ).
Advantages

1. Strong, Very durable material
2. Resistant to salts and sulfurs.
3. Resistant to wear a lot and not affected by the scratch with a lasting sheen.
4. Clearly does not require polishing or after installation.
5. Not to absorb colors and stains.
6. An attractive shape and great colors not available in marble.
7. Resistant to chemicals, Moisture, allergen and bacteria resistant
8. Low maintenance
9. Inexpensive
10. Fire resistances
Disadvantages

1. Weak and non-resistant wild, so do not use it in favor of floors in areas where there are high traffic commercial and public buildings.
2. If a tile is cracked or broken, it will be difficult to replace.
3. Hard and cold underfoot.
4. Ceramic tiles are somewhat delicate during installation
Store

1. Cleaning and drying the place of storing
2. packaging must be complete and cover all parts of the thick ceramic protects the body from shocks and it contains all the specifications of the sample.
• The specifications of the sample, such as:
  • The product code and number
  • Dimensions (length, width and thickness)
  • Color
  • Quantity (number and area)
  • Specifications for resistance to salts and acids
  • Slip resistance
  • Resistance to frost
  • Moisture resistance
Product Name: 
Wood Look Glazed Ceramic Tile

Model Number: 
F1217

Description:

Wood Look Glazed Ceramic Tile Features:
1. General use: Floor & wall using
2. Water absorption: < 0.5%
3. Polished degree: > 65 degree
4. Hardness (MoHS scale): ≥7
5. Sizes: 400X400mm, 500X500mm, 600X600mm, 300X600mm, 800X800mm
6. Custom sizes are available.

Packaging Details: Inner packing: Plastic foam or cardboard protects the delicate goods from damage Outer packing:
Delivery Time: 20~30 days
Type of ceramic tile

- In fact, a porcelain tile can be considered a special type of ceramic tile
Classification of the tiles by absorption of water

- Tile little absorption of water
- Tile high absorption of water
<table>
<thead>
<tr>
<th>Characters</th>
<th>Tile little absorption of water (glazed)</th>
<th>Tile high absorption of water (unglazed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characters</td>
<td>Heavy body</td>
<td>Thin body</td>
</tr>
<tr>
<td>Closed pores</td>
<td>Pores open</td>
<td></td>
</tr>
<tr>
<td>Resistant to frost</td>
<td>resistant to frost</td>
<td>Resistant to frost</td>
</tr>
<tr>
<td>Transmission of sound through which resonant</td>
<td>Transmission of sound through (unmusical)</td>
<td></td>
</tr>
<tr>
<td>Uses</td>
<td>ceramic coating suitable for floors exposed to moisture such as bathroom floors and walls and exterior walls exposed to the elements directly</td>
<td>ceramic flooring suitable or bedrooms, halls and corridors to prevent the transmission of sounds to the basement</td>
</tr>
</tbody>
</table>
Unglazed ceramic tiles

Glazed ceramic tiles
Tests for quality

- Determine the quality of tiles:

  1. Purity of raw materials and free of impurities
  2. Strength of cohesion biskuit
  3. Dimensional accuracy of his court and one o'clock a group of tiles
  4. Flat surface for the tile surface is designed to be flat
  5. Color fastness
  6. Corrosion resistance
  7. Homogeneity of the colors of the tiles
  8. Resistance to acids and salts which must be resistant coatings have
  9. Water absorption
In Gaza

- Acutely Ceramic tile is the reality of the most famous types of tiles in the Gaza Strip, and called it as “krameka” and ceramics tile.
- There it forms and a variety of sizes, several of the possibility of worse China, Turkey, Israel, Egypt, Spain, where all do justice to the production market ”Commercial“ of the East of class ”c”.

Classification

- The highest classification is first class ”A”, second class “B”, and third class “C”.
- The existence of the visible defects in a sample of ceramics is one of the biggest problems facing the plant where this sample is classified as a list of blending (Stoke), and these defects:
  - 1. Uneven color
  - 2. The presence of spots on the tile surface (enamel)
  - 3. Not cover the color of all the surface of the tile
  - 4. High surface roughness
  - 5. Increase the amount of paint
  - 6. Rub the surface
PRICE

- It’s range at 26-80 NIS

Names

- It’s deposed on manufacturing company’s (they namened it and send a catalog with details.
The solar choose the types from catalog by it’s name
Installing

First - floor tiles:

- the surface to be tiled must be clean.
- laying a layer of sand over the surface to ensure its level.
- laying a layer of sand mixed with dry cement over the previous layer to increase the carrying capacity of the inflicted loads.
- installing the porcelain on a layer of mortar with not less than 2.5 cm thickness.
- leaving spaces between each tile and its neighbors by 2-10 mm.
- Grout the lines between the tiles with the suitable cement.
- and wipe off any excess grout with a damp cloth
Second -as wall tiles:

in case using porcelain as walls and facades tiles, we use one of two ways:

1- paste the tiles by cement mortar, and in this case it does not require the vertically of walls.
2- paste the tiles by adhesives, in this case requires plastering the wall before starting installing the tiles.
Details

Figure A
The process of installation
Grouting porcelain tile

After you have finished installing porcelain tile, a polymer-modified, liquid-latex fortified or epoxy grout should be used. While grout-staining problems are extremely rare when using Porcelain tile products, a small test patch is recommended when using a dark grout over a light-colored tile, or vice versa. The test patch will also verify cleanability of the grout with heavily textured tile surfaces.

Cutting porcelain tile

• using a continuous rim diamond tip blade designed for porcelain tile and glass.
• Cutting porcelain tiles is more difficult than regular ceramic tile.
Tools
The process of setting floor:
يقع في الماء يعتمد علي الشركة المصنعة، وهو في الأغلب للجدران الا انه هناك بعض الشركات من نوع معين تطلب في الأرضيات النقع في الماء أيضاً.

يعتمد لون المونة علي لون البلاط المستخدم لايجلبي السراميك بحجر الجلخ، ويجيء بالماء ومواد التنظيف وماء.
Porcelain History

Porcelain has a long history. Used in China since the early Han Dynasty, old Chinese porcelain art tiles being one example we can see today.

In Europe since the early 1700s, porcelain has been used for many decorative and functional purposes.

In Europe, Italian porcelain tile being some of the most prized, places of worship and fine homes began using decorative porcelain tiles for floors and walls, creating durable and elegant entranceways and artwork.
Components

The primary components of porcelain are white clays, feldspar or flint, and silica, this is partially drained and stored in soils to allow homogeneity then pressure by hydraulic compressor exceed 500 kg/cm² and heat treatment up to 1200 degrees Celsius.
The types of Porcelain tiles

- Full body
- Shell
- Rough (matte)
- Smooth (glossy)
Shell

Full body
Sizes

For floor:
40 *40
50 *50
45*45
60*30
60*60 ..... the most popular
60*80
60*90
80*80

For walls:
15*40
20*40
Price

34 – 120 Nis /m²

Weight

7-8 kg for 60 * 60 cm tile
Thickness

Full body:
1 cm porcelain body

Shell:
8 mm porcelain body
2 mm glazed cover
Total: 1 cm
Samples in Gaza:
Installation of porcelain

laying porcelain tile can be tedious and time consuming work and it relates to some skills.

The job conditions

• skill level of the installer
• the products being used
• the expected usage after installation will all contribute to the final installation methods
• Be sure to get the right mortar
Maintenances

1. polishing
2. removing the failed piece
Porcelain is used in

- Floor and walls, internal and external.
- Airports, malls, palaces, hotels, exhibitions, restaurants, banks interfaces m villas and luxury building.
- Kitchen and bathrooms
- patio or sidewalk without worries of cracks developing due to freezing
- household applications
Applications
Cleaning Porcelain

Simply by using a nonabrasive clean mop and warm refine water to remove soils that sweeping, vacuuming or damp mopping leave behind
Advantages of Porcelain

- One of the strongest fired flooring options today
- More durable material than ceramic tiles.
- Needs minimal maintenance and does not require polishing after installation.
- Very hard to be shipped or cracked easily
- high resistance to scratches, chemicals, Corrosion and fire.
- Lower moisture absorption leads to lesser staining and easier cleaning.
- available in many different styles, colors and designs.
- Water, salts and allergen and bacteria resistant
- the choice of emperors, royalty, and privileged.
Disadvantages of porcelain

- Very hard and cold underfoot that may cause excessive stress on the joints.
- Porcelain tiles are heavy, specially the larger sizes.
- Expensive.
- Lack of uniformity of size and shape.
- Tiles with glossy finish become very slippery especially on wet floors.
- Installation of porcelain tiles needs the services of a professional.
- Its increased density means that it's very hard and more difficult to cut.
Tests on porcelain

1. checking the regularity dimensions.
2. Friction test.
3. Edges integrity test.
5. Chemicals and acids test.
Transport and storage

Materials supplied in containers labeled, well-coated and non-broken, tied with plastic pieces on the four corners.
Classification

- the highest classification is first class "A", second class "B", and third class "C".
- the porcelain sample is classified due to the existence of the visible defects.
Notes

• porcelain has a perpendicular edges.
• its laying costs more than ceramic tiles.
• the glazed porcelain is stronger than the rough one.
Ceramic Tile Vs. Porcelain Tile

- Porcelain tiles are not very different from ceramic tiles and both are great for giving a classy and luxurious look to your home. However, differences exist in their relative hardness, durability and resistance to cracks and moisture.
1. Contain:

- Ceramic tiles are made from clay (that contain kaolinite mineral), quartz, sand and ferrous materials.
- The porcelain clay contain a higher proportion of kaolinites, which is a silicate mineral. In addition, porcelain tiles are manufactured by heating at a higher temperature and for a longer duration than ceramic tiles. Therefore, they are harder and denser than ceramic tiles.
2. Types:

- Both ceramic and porcelain tiles come in two forms, glazed and unglazed. The glazed ceramic tiles are a bit slippery than the unglazed ones and they are more suitable for wall applications than for flooring. On the other hand, glazed porcelain tiles are less porous and require low maintenance than the unglazed ones.
4. Price

- They are less expensive than porcelain tiles. They are resistant to fire, chemicals and stains, but show less resistance to scratches and cracks as compared to porcelain tiles.

5. Thickness:

- 1 cm porcelain
- 6-1 cm ceramic
http://www.madehow.com/Volume-1/Ceramic-Tile.html#b