

FIXING, CLEANING AND
MAINTENANCE INSTRUCTIONS



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01 OUR PRODUCTS' QUALITY –

All porcelain products manufactured in our facilities located in San Juan de Moro (Castellon), Spain, are produced under the highest quality standards, selecting the best materials in the market (clays, quartz, feldspar, kaolin...), and incorporating into our production process the best techniques available. Best Practices such as the use of mobile silos with automatic supply which deposit an accurate dosing, pressing in small and large sizes, rectifying of the entire production, sealing the micropore for lappato and polished finishes on production lines equipped with suitable polishing tools, automatic classification by surface recognition machines or availability of a computer system that enables automated radiofrequency internal logistics. Our technical facilities and production sites are one of the most advanced worldwide due to the referred techniques and technology employed.

Porcelain tile products sold under the trademark APAVISA are unglazed and manufactured through a process of double firing. This process yields inert products, all our products have high resistances and very low water absorption (impervious porcelain tiles). Our high standards can only be met with a constant attitude improvement and through a strong investment in R&D always keeping our production processes at the forefront of the latest trends in design and technical matters, which make APAVISA one of the top porcelain trademarks in the world.

Our production process is environmentally friendly, being certified under ISO 14001:2004 standards. It also follows a quality control system of porcelain tiles with ISO 9001:2008 certification. In most LEED accreditation processes our products contribute to the acquisition of LEED credits, using the COVERLEEDbyITC software, which was developed in collaboration with the Institute of Ceramic Technology (ITC).

These high performance porcelain tiles, as any kind of material, require following the recommendations for fixing, maintaining and cleaning. This will contribute to a proper use and optimum functionality of our products, consistent with their high quality standards.

02 FIXING TIPS –

1) Care to be taken during the construction

Our porcelain products can be considered as a final finish in the construction process, so it is advisable to be laid only when the rest of the building works are complete (structures, masonry, flooring, ceilings...); specially the flooring. This will minimize the collateral damage that sometimes occurs when the product is being placed too soon.

When porcelain tiles are placed before the end of the construction, one must take special care to protect the piece until the works are finalized. The accumulation of dirt, debris, adhesive products, paints... which are generated during any construction can adversely affect the tiles if these are not protected. Therefore, and even though our products have a protective film in order to block the surface micro pores, the best way to protect the tile surface is by covering it during the final works with a protective layer of paper, cardboard, thick plastic, fabric, cloth, wood or any other material which does not negatively affect the performance of the tile. It is also advisable to avoid excessive loads such as transport vehicles, dropping or dragging of machines or tools, or impregnation of bonding materials which may affect negatively its later cleaning and maintenance.

To summarize, it is better to be careful and prevent any harm during the construction works, than having to solve a problem generated by an unusual use of porcelain tiles during construction. Our recommendation is to protect the product as much as possible from these hazards.

2) Pre-fixing issues -

Before starting the process of placing porcelain products one should consider the following:

- Upon receiving porcelain tiles it is essential to check if the tone, size and quality meet the required standards in advance, as well as assuring the lack of any visible surface defects. In case of facing any problems, our technical team will be able to study these when informed before laying the product. It will be impossible to do this once the product has been laid.

- One must choose the proper tools for laying ceramic products (serrated edged comb, rubber mallet, suction cups, spreaders and clamps for laying, jointing rubber float, ...)
- Mix pieces from different boxes.

3) Support base preparation-

The support base for wall or floor for the tiles must be stable, dry, flat and it must have the adequate consistency. This base must never be too hot nor too cold and should be clean. One must not forget to clean any dust, grease or oil leftovers to facilitate an optimal adhesion.

The previous waterproofing of the support base is convenient. This waterproofing process can be done using asphalt fabric or similar products and should be done, specially, in humid areas.

It is convenient to use slightly rough support bases, altering any excessively smooth leveling layer, in order to ensure greater adherence.

4) Adhesive choice -

The type of adhesive will be determined by the water absorption of each type of tile.

In our case, since porcelain tiles have a water absorption level below 0.5% ($E_b < 0.5\%$) it is advisable to employ the technique of placing a thin layer of cement adhesive of type C2.

For formats larger than 30x30cm, we recommend the double-layer-adhesive. This technique involves the appliance of adhesive on the support base as well as on the tile; this technique is strongly recommended for outdoors.

The bonding material must be applied with serrated edged comb to achieve a homogeneous adhesive distribution throughout the laying surface, even in the corners

of the tile. A non-uniform adhesive layer will cause tensions on the tile, which will create an "eyebrow" effect.

It is advisable to follow the instructions of the adhesives manufacturer, particularly for different cement-based bonding materials, the most common, and specific placement requirements, as well as for the preparation of these. For example, the following are useful tips: apply cementitious adhesives at room temperature, and generally at a temperature between +5 ° C and +30-35 ° C, do not apply in rain or frost risk, considering that the wind shortens the adhesive's curing time, respect timeouts indicated by the adhesives manufacturer, conduct a mechanical beating to prevent clumping, consider using a middle layer (up to 15 mm) as an alternative to thin layer techniques to allow flatness deviations, etc.

5) **Tile installation-**

The previous handling of the tiles, especially the rectified, must be done with utmost care to avoid scratches or chipping of the tiles.

During the fixing process, the surface shall not be marked by graphite materials (pencils) or permanent markers, especially in the case of polished products to avoid potential cleaning problems.

During laying and whilst the adhesive has not dried (usually at the end or beginning of each day) it is convenient to perform a visual inspection of the already placed tiles, in case the correction of any misplacement is necessary. Solving this can be done with the help of suction cups and a rubber mallet. Note that the tile adhesive will reduce its volume when dried; you have to consider this when laying the tiles and making breaks since there can be a problem with correct leveling of the tiles.

In the placement of tiles the use of at least 2mm spreaders is advisable. For locked placement, it is advisable to fix at a distance from 1/3 of the piece, never at half of the piece.

In large format porcelain pieces (over 60cm of any of its sides) it is convenient to use leveling clips to ensure the flatness of the pieces (such as the Raimondi leveling system, although there may be other manufacturers recommended in the market).

6) Joints and grouts -

The main functions of installation joints are: to absorb deformations of the support, to increase surface adhesion between the parts and the bonding material, and to improve the impermeability of the surface.

It is necessary to respect the indications given below:

- Structural joints: the construction project already takes into account the existence of these joints in the floor coverings, usually every 30 to 35 m², and half as many in outdoor areas. These must also abide when covering the joint with plastic trims.
- Perimeter joints: it is always appropriate to provide these joints that isolate the tile and bonding material from any structural movements, avoiding tensions with them. Perimeter joints are normally hidden by the skirting board or the tile itself; they must have a width of 5 to 10 mm, and may be empty or filled with deformable material.
- Expansion joints: allow deformations due to thermal and hygroscopic variations between tiles between the bonding material and the support base. Usually designed with a width of 5-8 mm and surfaces from 25 m² (in sections of 5x5 m²) indoor and surfaces from 9 m² (in sections of 3x3 m²) outdoors. These joints must be well executed, this means that they must be flexible, waterproof, well bonded and must reach the base support.
- Installation joints: those between tiles. They exert an aesthetic function and also compensate slight variations. Before grouting these must be empty, without any bonding materials. It is not recommended to fix any floor without joints, advising a minimum joint of 2-3 mm (in order to allow for better setting and better absorption of tile movements).

The grout used in installation joints must be applied with a rubber float. The market offers a wide range of grouts, which are suitable for each type of tile and temperature as specified by the manufacturer of the grout, in which the type of product to be used, colors and waiting time before grouting should be recommended.

Before grouting, it is advisable to test a small area of the part to determine whether the chosen grout affects or stains the surface of the piece. In this case, one should contact the grout manufacturer. Ask the manufacturer for a suitable cleaner for this type of grip



material. A bonding material with a thin granulometry is desirable in order to avoid scratches on the tile during its placement.

03 CLEANING AND MAINTENANCE TIPS-

1) The first cleaning “after installation” -

The most important cleaning operation is performed immediately after laying the tiles. This involves the complete removal of residues and dirt from the tile placement. An inadequate or late removal of this waste can create a cementitious layer on the tile capable of absorbing all forms of dirt. This may give the impression that the tile gets dirty when the actual problem resides in the surface film of dirt which was not removed immediately after laying.

Once the grouting of the tiles is finished, it is important, while the grout is still wet, to carefully remove any excess material immediately. This can be done using a sponge and plenty of clean water, repeating this as many times as necessary. It is essential that all remaining water is later absorbed through wet vacuuming or using a dry cloth, this way avoiding the dirt from moving.

Do not perform the cleaning with metal tools, scrapers or abrasive pads. For stubborn stains, clean with alcohol and lukewarm water and rub with a clean cloth. If they do not disappear, check with the relevant technical department.

It is suggested to carry out a preliminary wash over an area of a few squared meters sample: if the end result is positive, you can proceed to cleaning the entire surface.

Once the above mentioned washing is done, another washing should be carried out using basic or alkaline degreasing agents, as acid washing can leave stickiness on the pavement which could help retain dirt. In areas where water is calcareous, it is convenient to dry the surface, in order to prevent the deposition of carbonates which will reduce the surfaces' gleam.

2) Sealing surfaces -



The low water absorption and high standards met by all porcelain tiles of APAVISA ensure a product which is easy to maintain. APAVISA products do not require the use of sealants or waxes. These superficial coatings can really affect the performance of the tile in a negative manner.

3) Regular maintenance -

The high standards met by APAVISA products ensure that it will be relatively easy to maintain and provide a long lifetime of the product.

Many available cleaning products for general use can be used with APAVISA products. For daily cleaning, one can use detergents or degreasing products diluted in warm water, following each product's instructions.

It is important that the cleaner does not have oil, animal fat, or soap base. These components may leave an invisible residue whilst absorbing dirt (lime stratifications detergent or residues). It is also important that the tile receives a thorough rinsing with clean water after the cleaning process is complete.

It often occurs with some detergents available, which contain waxes or polishing additives, that after several washings, a layer can be deposited onto the flooring. Sometimes, a single drop of coke, water, wine, etc. may be enough to remove this layer, restoring the original look of the tile. In such cases, we must first remove the wax using flooring wax remover products, following the directions given by the manufacturer.

It is important to note that hydrofluoric acid (HF) and derivatives can irreparably damage the tile.

The general steps for regular cleaning of APAVISA products can be summarized as follows:

- Remove any solid or liquid waste from the tile, sweeping with a soft bristle broom or vacuuming.



- Clean up liquid spills as soon as possible with lukewarm water.
- Apply the recommended amount and dilution of the cleaner for the tile (follow the cleaner manufacturer's instructions). The wiper must remain in the tile a minimum period of 5 minutes.
- For unpolished tiles, scrub with a nylon sponge or soft bristle brush. A floor machine equipped with a nylon pad or bristle brush can be used for heavily soiled surfaces. For polished tiles, clean with a nonabrasive cloth.
- Remove the dirty cleaning solution and water with a vacuum cleaner or cloth. Rinse the porcelain tile with clean water and remove again with a vacuum cleaner, mop or towel. It is absolutely essential that all detergent residues are removed completely from the tile. Any remaining detergent that dries on the tiles surface can form a coating that can trap dirt and be very difficult to remove. The tile should be rinsed several times to remove all detergent residues.

The frequency and time of maintenance depends on the specific characteristics of each tile. Other factors such as the amount of traffic, environmental conditions and the color of the product should be considered in planning your maintenance program. In high traffic areas or in areas subject to excessive exposure to dirt, more frequent cleaning may be needed.

During use, the cleaning of the tiles should be similar to window cleaning. Ammonia and even bleach type products can be employed, but both must be diluted in water.

In case of special stains and/or particularly resistant, it is advisable to use specific detergents according to the cleaners' manufacturer. Do not forget that removing any type of stain is easier when it is still fresh.

It is important to always do a pre-test the detergent products result on a small sample of the porcelain.

4) **A special case: tiles with metallic effects -**



This type of tiles require following these recommended guidelines, shown below, for cleaning:

- In general, you can use any non-aggressive and neutral pH product.
- In general, we recommend the use of ammonia-based products (NH_3) diluted in water, never directly on the piece.
- You cannot use chemically aggressive products.
- You cannot use products with hydrochloric acid (HCl). The remaining acid products should be used with caution in very diluted concentrations.
- Citric acid and other acidic food products leave stains if left too long to act on the tile. They must be removed as soon as possible.
- The use of powder products of abrasive action is not recommended.

04 BIBLIOGRAPHY –

In preparing these "FIXING AND MAINTENANCE INSTRUCTIONS" by APAVISA we have considered the following publications and documents:

- "MANUAL - TECHNICAL GUIDE OF WALL AND FLOOR CERAMIC COVERINGS", Institute of Ceramic Technology (ITC).
- "ELECTRONIC GUIDE OF THE TECHNOLOGY OF CERAMIC TILE PLACEMENT (Placement Project)", Institute of Ceramics Promotion (CPI)
- "TECHNICAL GUIDE OF THE APPLICATION OF WALL AND FLOOR CERAMIC COVERINGS", Tile Newspaper (AZ Publications)