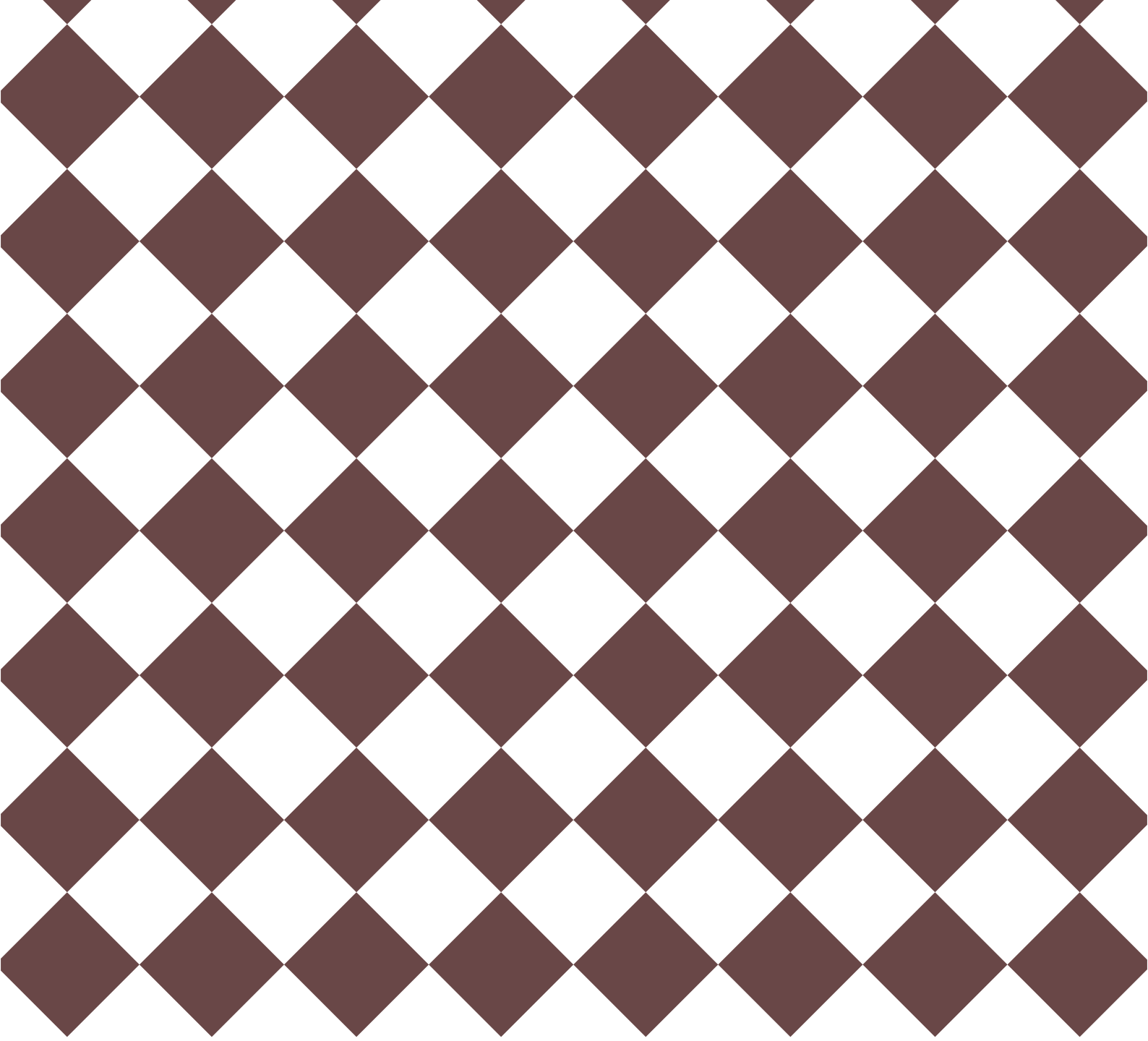


todobarro.

Installation guide

august 2021

All you need to know about installing
our terracotta floors

1. Introduction

This document is intended to provide useful technical information for achieving optimal results when installing products from the todobarro catalog.

The recommendations found in this document are based on the UNE 138002:2017 standard, "General rules for the installation of ceramic tiles with bonding materials," as well as Proalso's training manuals for becoming a Licensed Professional Wall/Floor Tiler.

2. Receiving material from todobarro

Open and check each package before laying the tiles, as we will not accept any claims for demolition or reinstallation costs once the tiles have been laid.

Bear in mind that this is a product with tonal variation, so tiles from different boxes must be mixed randomly prior to installation in order to create a uniform tonal variation across the entire tiled surface.

In terms of aesthetics, terracotta tiles are known for their non-uniform, earthen-colored body and their irregular texture with grains, pores and pits in the surface that give them a natural, rustic and original appearance.

It is very **likely that the material will arrive wet**, due to the final process of aging the tiles. This may give the appearance of a different tonality from the true tonality that the terracotta will ultimately show. There may even be saltpeter visible on the surface, but this is nothing to fear, since any saltpeter and debris from installation will be removed once you perform the final cleaning process, following the instructions found in our cleaning and protection guide..

Pallet reception from todobarro

Tile detonation

3. Installation

If you have any concerns, stop laying the tiles and contact us at todobarro.

Any problems will be much easier to solve if the tiles have not yet been installed!

It is important to use qualified professional wall/floor tilers for quality installation work on each project and to ensure an optimal end result, both technically and aesthetically.

Following the recommendations found in this guide and taking the particularities of each project into account will ensure a technically and aesthetically sound result, so that the user can enjoy the tilework with a guarantee of quality and durability.

The terracotta tiles from todobarro's catalog are artisanal products that require a proper specification in keeping with their intended use, a selection of suitable materials, and a good installation in order to form part of a fully functional ceramic tiling system.

In all cases, reading the manufacturer's recommendations and the data sheets for all the products and materials used is an absolute must.

Technical and design sheet

4. Ceramic tiling systems

Ceramic tiling systems are construction solutions with tiled surfaces installed with bonding materials.
A **CERAMIC TILING SYSTEM** is defined as a set of layers with different functions and characteristics:

First layer:

This is the **base substrate** of the system, which is also referred to as the structural support. It is the element that supports all the other layers. It coincides with structural elements described and classified in Spain's Technical Building Code (referred to by the Spanish acronym "CTE"), and it supports its own weight, loads and forces induced from other elements, and service loads.

Intermediate layers:

From the standpoint of installation, we can group the various intermediate layers into the following two blocks:

a) Firstly, we have layers that are executed to adapt surfaces in order to make them flat, stable, plumb (when dealing with vertical elements) or level (when dealing with horizontal ones), suitably cohesive and clean, and compatible with the ceramic tile installation technique.

This block includes:

- screeds
- regularizing layers
- load distribution layers
- decoupling layers

b) Secondly, we have layers that add a specific function or additional benefit to the ceramic tiling system.

This block includes:

- thermal and acousting insulation
- waterproofing
- drainage
- vapor barriers
- underfloor heating

If you intend to use any of the aforementioned intermediate layers, see the specific installation instructions for those products.

Final layer

The final layer can be broken down as follows:

- The **installation surface** is the final layer over the intermediate layers to which the bonding material (a mortar or adhesive) will be applied in order to install the tiles.

This surface must be completely clean before beginning to lay the tiles. Any debris that is not removed will create weak bonding points that may cause problems in the future.

It is also necessary for the surface to be perfectly dry (always less than 3%), plumb, level and flat (less than 3 mm deviation over a length of 2 m in any direction is recommended). The surface must also have good cohesion (no pieces of it should come off).

Water-sensitive substrates (e.g., wood) may require a waterproofing primer. For these substrates, a suitable bonding material must be selected.

The bonding material:
There are two major categories:

- traditional mortars
- adhesives

El material de rejuntado:
Again, there are two major categories

- tile-to-tile joints
- movement joins

Taking the foregoing layers into account, we can arrive at the following **CLASSIFICATION of Ceramic Tiling Systems** into which the terracotta tiles can be installed:

Horizontal Systems:

- **P1:** Direct system
- **P2:** System with intermediate layers
- **E1**: System on a natural area of level ground for pedestrian traffic

Vertical System:

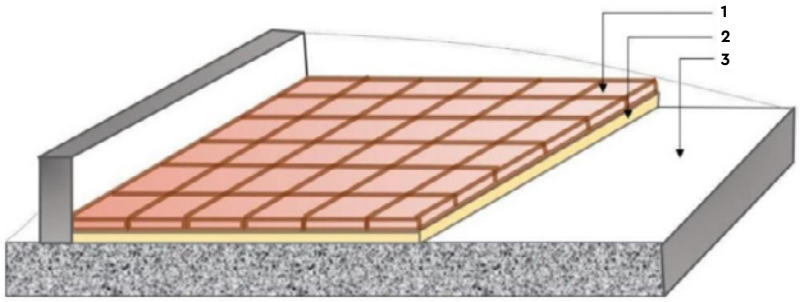
- **R1**: Direct system
- **R2**: System with intermediate layers

The following sketches show the different types of horizontal ceramic tiling systems:

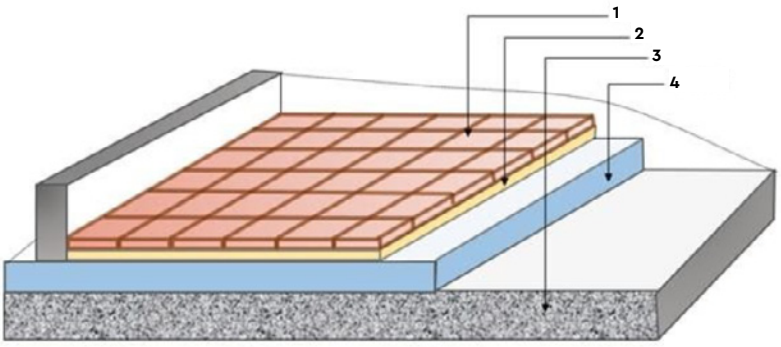
4.1. Horizontal ceramic system

KEY:

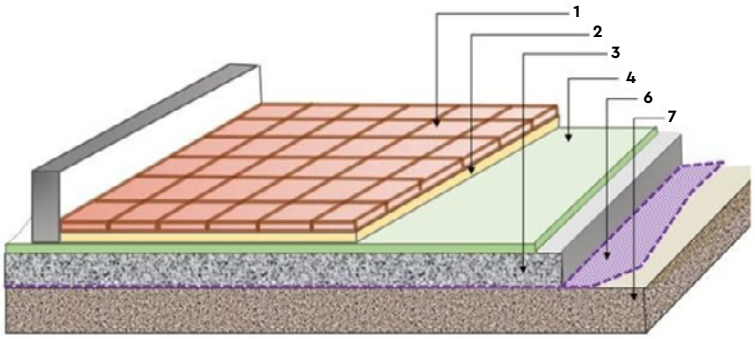
1. Terracotta flooring
2. Bonding material
3. Base substrate
4. Intermediate layers
5. Regularizing layers
6. Separation layer
7. Natural area of level ground (compacted natural soil, CBR Ratio > 5; otherwise, replace with filler soil)



P1: Direct system



P2: Interlayer system

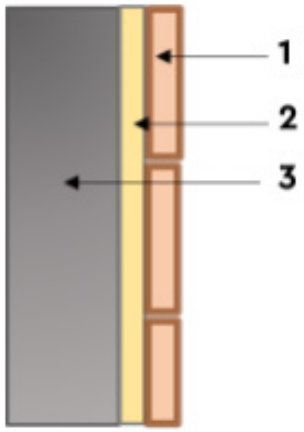


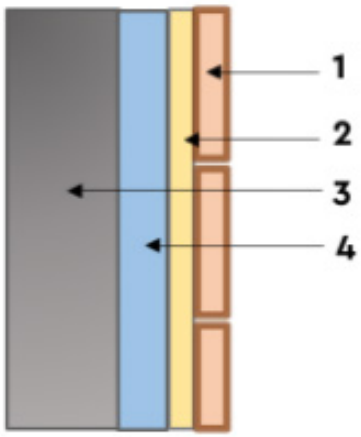
P3: System on natural esplanade for pedestrian traffic

4.2. Vertical ceramic system

leyenda:

1. Terracotta tile
2. Bonding material
3. Base substrate
4. Intermediate layers





The terracotta tile is the central focus of the ceramic tiling system. However, **in order to guarantee the durability and technical quality of a ceramic tiling system, it is fundamental for the installer to be able to identify, classify and execute the various layers of the ceramic tiling system with the appropriate materials**, starting from the structural support, continuing through the intermediate layers, and ending with the layer of terracotta tiles.

5. Tile-to-tile joints and movement joints

The types of joints to be executed in a terracotta floor or wall can be categorized as follows:

1. Tile-to-tile joints are defined as the physical separation between adjacent tiles which is necessary in order to compensate for any dimensional deviations in the ceramic tiles themselves and to absorb stresses. Tile-to-tile joints help to facilitate the repair of individual tiles.

Lay the tiles with a joint of at least 3 mm for small tiles and 5 mm and up for larger formats.

Tiles should not be laid edge-to-edge without a joint. Laying tiles without a joint contributes to the tile-to-tile propagation of stresses from the substrate and from the expansion of the tiled surface itself, which can lead to lifting, detachment or cracking.

2. Movement joints are defined as the physical separation of the tiled surface into sections in order to absorb the stresses generated in the ceramic tiling system.

The dimensioning, location and layout of the movement joints must be established by the project planner in keeping with the particularities of each project.

Movement joints can be classified as follows, in keeping with their functionality and location:

· **Structural joints** are used in buildings, dividing the structure to allow the free movement of the parts. Expansion joints affect all layers of the ceramic tiling system and must be finished with special profiles or sealants.

· **Expansion joints** in the ceramic tiling surface affect only the thickness of the ceramic portion to subdivide the sections into smaller regular areas, with the aim of avoiding the accumulation of stresses stemming from expansions and contractions in the ceramic tiling surface. These joints are finished with prefabricated profiles or elastic sealants.

For the sizing of expansion joints, use the following criteria:

· Exterior walls.- (joint width ≥ 8 mm), separation length of 3–4 m and maximum regular area of 16 m^2.

· Interior flooring.- (joint width ≥ 5 mm), separation length ≤ 8 m and maximum regular area of 40 m^2.

· Exterior flooring.- (joint width ≥ 8 mm), separation length 2.5–5 m and maximum regular area of 16 m^2.

· Singular points.- Doorways and flooring changes.

· **Perimeter joints** are placed at changes of plane and at the boundaries of the areas to be tiled, with the aim of minimizing the accumulation of stresses. In floors, this affects the tiled surface and the thickness of the mortar screed, while in walls, it affects the tiled surface only. The recommended joint width is ≥ 5–8 mm.

Installation joints

6. Choosing the bonding material

Bonding materials can be categorized as traditional mortars and adhesives, which we will describe below.

6.1. Traditional mortars

These are a mix of one or more binders (normally cement and/or lime), aggregate (usually sand) and water, and they may incorporate other additives.

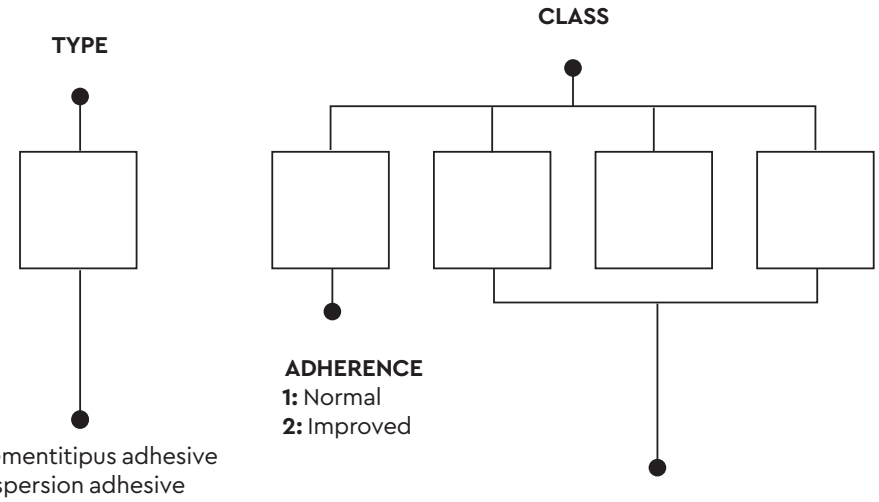
Laying tiles with traditional mortar as the bonding material is becoming less and less common, especially in remodeling.

The UNE 138002 standard indicates the possibility of using traditional cement mortar as a bonding material for the installation of ceramic tiles only in direct ceramic tiling systems (R1 and P1, see previous section), establishing a series of very specific limitations.

In general, todobarro does not recommend using traditional mortars as a bonding material to install artisanal terracotta tiles, given the numerous limitations established by this same standard.

6.2. Adhesives

These are all the types of bonding materials defined in the UNE-EN 12004 standard, which are used in practically all possible situations. The standard describes three types of adhesives with their clasification:



F: Fast-Setting / Fast-Drying (**C** Adhesive)
T: Deslizamiento reducido. (For all types **C,D,R**)
E: Tiempo abierto ampliado (adhesives **C** y **D)**

As a general rule, todobarro tiles can be bonded with **class-2 cementitious adhesive** (C2 adhesive mortar) on cementitious, concrete or brick surfaces.
For a higher level of specification, please refer to the following table, which provides a simplified indication of the types of adhesives that are recommended depending on the type of surface to be tiled:

Surface to be tiled	Type of adhesive	Comments
Ceramic brick, ceramic or concrete blocks **Plastering and rendering**	**C2**	In case of harsh weather (humidity, high or low temperatures, wind) use an adhesive with extended open time (E), and do not use type F (fast-setting/fast-drying). You may need to use deformable adhesives (S1 or S2).
Flat concrete surfaces	**R**	Use when chemical resistance is needed.
Ceramic tiles, terrazzo or natural stone	**C2**	In case of harsh weather (humidity, high or low temperatures, wind) use an adhesive with extended open time (E), and do not use type F (fast-setting/fast-drying).
	R	Use when chemical resistance is needed.
Metal or wood	**R deformable**	Epoxy or polyurethane resins.

For wall installation with cementitious adhesives (type C), we recommend using a non-sag option (T). This characteristic appears in many cementitious adhesives, and it will be very easy to find in your usual hardware store.

Adhesive

7. Choosing the grouting material

According to the UNE-EN 13888 standard, grouting materials for ceramic tiles can be of the following **types, depending on the chemical nature of their binders:**

CG Cementitious Grouts. These grouts can be divided into two classes:

1. Normal cementitious grout.
2. Improved cementitious grout.

W: Reduced water absorption
A: High abrasion resistance

RG Reaction Resin Grout

The choice of grouting material will depend on the intended use of the ceramic tile surface and the width of the joint to be filled. It is a good idea to **check with the manufacturer of the grouting material** as to the most suitable type of material in each case.

It is most common to use white or gray grouting materials, but you can have used colored materials to go with the color of the tiles or to contrast with them. We recommend that you take some time to try out the different options. You will see how the appearance of your room changes depending on the color of the joint.

In any case, do not use materials colored with carbon black (micronized carbon), as the residues they leave on the tiles are very difficult to clean.

As a general rule, traditional cement mortar grouts can be used for terracotta tile floors. Those with gray cement and sand or those with white cement (with or without dye) and white sand are both valid options. The choice should be made according to the criteria of the project.

The UNE 138002 standard establishes that the following grouting materials can be chosen **according to the destination environment** of the ceramic tiling:

Acronym	Conditions
CG1	Conditions of domestic use in dry areas
CG2W	Conditions of domestic use in wet areas
CG2WA	Exterior floorings and tiled surfaces
RG	Conditions that require water – and vapor – tightness and in food and/or sanitary areas

Grouting material

8. Laying the tiles

In order to ensure the proper installation of ceramic tiles with bonding materials and a quality end result, careful planning is required. Good overall planning helps to ensure that the steps of the tile laying process will begin and continue in sequence without interruptions or wasted materials. It also ensures better performance.

8.1. Enviromental conditions for applying the materials

While the ceramic tiles are being installed, the ambient temperature and humidity, as well as the exposure to the sun, wind, and rain, must not reach levels that will affect the characteristics of the substrates or their behavior during the application and curing of the bonding and grouting materials.

• **In general,** terracotta tiles should not be laid when the temperature of the air, substrates or materials is below 41 °F (5 °C) or above 95 °F (35 °C).

• **Outdoors,** do not lay tiles in adverse weather conditions (rain, snow, wind). Special care should be taken to avoid the presence of moisture, rain or risk of frost during outdoor installation and for the first 48 hours after completion of the work, in order to avoid negative consequences on the setting of the adhesives.

Tile laying

8.2. General planning and staking out the space to be tiled

First of all, **check** that the installation surface is **dry, stable, flat and plumb or level, and that it has good cohesion**.

Do not begin laying tiles if the installation surface is not in proper condition, because the result may be disastrous and very difficult to correct.

Give the installation surface a thorough **cleaning**. This is essential. Remove all remaining plaster, grease, wax, globs of mortar, cement slurry, organic matter, and dust.

Any debris that you do not remove may reduce the adhesion of the adhesive and cause tiles to come off in the future.

The task of **staking out** the area to be tiled prior to the start of the installation work **is an essential step** for the technical and aesthetic quality of any tiled surface, and this is even more important when dealing with combinations of tiles in the same composition.

Properly staking out each project helps to simplify tile-cutting, avoid having to make substitutions and corrections, resolve singular points and meeting points, minimize wasted material, improve performance, and avoid narrow strips, asymmetries and incorrect optical effects.

The area to be tiled should be generally staked out after the general cleaning but before gathering the materials and organizing the work site, as a step prior to laying the tiles.

The task of **staking out involves creating a pattern of joints for the ceramic tiles and combining or arranging them in a certain way**, relying on the tile-to-tile joint and adapting it to the limitations imposed by the surface to be tiled, performing an exact calculation of its layout.

The project specifications should include information regarding the width of the tile-to-tile joint and the layout of the joint pattern, in addition to the location of the corresponding movement joints. Nevertheless, in the absence of a project plan in remodeling and restoration work, it is the installer who must stake out the area to be tiled.

Laying support cleaning

Stake out phase

Staking out the area should include the following **steps**:

• **Confirmation** of all **measurements of the area to be tiled**, including openings and available width in the meeting points with any carpentry.

• Staking out flatness, plumbing wall surfaces, leveling horizontal surfaces, checking openings and the condition of substrates.

• Layout of the tile-to-tile joint pattern in keeping with the actual measurements of the surface to be tiled and the planned movement joints.

• In the case of projects with some complexity due to the shape of the surface to be tiled or the combination of different tile shapes and colors, we recommend **making a 1:50-scale sketch** with the dimensions and layout of the pieces.

• Selection of the layout of the joint pattern according to the confirmed dimensions with the aim of **avoiding narrow strips and/or small points** (miter tile installation) and relying on the lowest possible number of tile cuts. For a square format, a narrow strip is considered to be any piece with a side less than half of the format.

• It is important to mark **the laying lines** with a chalk reel, thread or laser, every two or three courses, in order to maintain controlled alignment.

• In the case of laying combinations of pieces and formats in **tessellation modules**, it is highly advisable to mark the grids corresponding to each module on the surface to be tiled using a chalk reel, in order to adjust the regularity during installation.

• Inspection, cleaning and protection of **preexisting structural joints**. Staking out **movement joints** and planning the joint execution work.

The result of these dimensional control operations allows for gathering materials with certainty, staking out all the surfaces with respect to the layout of the joint pattern, and anticipating the cutting and handling of the tiles.

Failure to stake out the area to be tiled may result in significant deviations and irregularities in modulation that are considered **tile-laying defects**.

Lastly, organize all the necessary tools and materials and the tiles inside the room, in order to be able to work orderly and comfortably. It is a good idea to Lastly, organize all the necessary tools and materials and the tiles inside the room, in order to be able to work orderly and comfortably. It is a good idea to **distribute the tiles throughout the room**, so as not to have to make continual trips as the installation progresses. This process allows for a better review of the material and a good distribution by tonal variations. Thus, you can achieve the best effect by distributing the tonal variations, taking advantage of the singularity of the pieces, since they are all "unique."

Pre-installation presentation

Design sheet

Checking measurements

Stakeout of laying lines with tracer

8.3. Preparing the adhesive

Before proceeding with the laying of the tiles, the adhesive must be prepared, following the manufacturer's instructions to guarantee optimal performance.

Firstly, **do a preliminary check of your adhesives**, which involves:

• Checking the shelf life and expiration date of cementitious adhesives. Keeping track of the shelf life or time in storage under the conditions recommended by the manufacturer to keep the adhesive's properties intact is essential.

• The packaging date or manufacturing date should be indicated on the packaging.

• Check that the containers of adhesive are in perfect condition.

Preparación del adhesivo

• Check for the absence of hard granules or lumps in the powder of cementitious adhesives, which indicate partial hydration of the cement, which means the material is unsuitable for use.

Proper mixing is vitally important in order to obtain the benefits specified for each type of product. To that end, we must:

• Respect the mixing ratio in liters of water per container, as proposed by the manufacturer.

• Always pour the powder content from the container into the water already added to the mixing receptacle, following the manufacturer's instructions.

• Choose the type of mixer recommended by the manufacturer, one that is appropriate for the amount of adhesive to be mixed.

• Mix at low speed until a homogeneous mass is obtained, without turbulence and avoiding air occlusion.

• The result should be a homogeneous mass, with a creamy and uniform texture, free of lumps.

• After the initial mixing, wait for the maturation time or resting time indicated by the manufacturer and then proceed with a brief final mixing of the adhesive.

• Once the mixing is complete, DO NOT rectify the mixture and DO NOT add extra water during the useful life of the mixed adhesive.

Adhesive mixing operation

8.4. Choosing the bonding material application method

In this guide, we will focus on the adhesives for tile installation that are specified in the UNE 12004 standard, since they are the ones used in practically all possible situations, especially in remodeling and restoration.

The **adhesive application method is decisive** for ensuring technical performance, adherence and for **avoiding potential problems** associated with improper application.

8.4.1 Single gluing method

This method involves spreading the adhesive over the installation surface and then combing it with the specified notched trowel in a straight line, without making circles, until a regular layer of uniform thickness and flatness is obtained.

In order to be able to apply the adhesive in this way, a surface with a flatness deviation of less than 3 mm over a length of a 2 m is required. Otherwise, a prior regularization must be carried out.

Never increase the thickness of the adhesive layer or apply adhesive in globs to compensate for deviations in the flatness of the substrate, since the result would not be a layer of uniform thickness.

It is very important to carry out this operation in the shortest time possible and over a smaller surface area to avoid exceeding the adhesive's maximum open time, especially outdoors and with adverse environmental conditions.

The single gluing method should be used in all cases of laying any type of ceramic tile. In the cases indicated in the following section, there will also be an additional step, i.e., the double gluing method.

8.4.2 Double gluing method

The double gluing method is used in certain situations to improve the wetting of the tile, favoring uniform contact across the entire back surface, with the aim of achieving optimal and long-lasting adhesion.

The double gluing method involves the application of the adhesive specified for single gluing onto the substrate, combing the adhesive with the appropriate notched trowel with the grooves in a straight line, and then additionally applying a fine layer of adhesive on the back of the tile, spreading the material with the smooth part of the trowel.

This makes for a better contact between the substrate and tile without increasing the final thickness of the adhesive layer, which must not exceed the recommended maximum.

Never apply in globs (on the substrate or on the back of the tile), and never do double gluing by combing with the same notched trowel on the back of the tile (no matter whether this is done in the same direction or in the opposite direction).

An excessive layer of adhesive will cause differential shrinkage and decreased adhesion and performance of the adhesives, resulting in complications later on.

In the case of todobarro tiles, using the double gluing method is generally considered highly recommendable, and it should always be used outdoors, on flooring with underfloor heating, or if the project expressly calls for it.

Double gluing is also a good practice that protects and helps to reduce staining and the risk of efflorescence on highly porous materials such as terracotta tiles.

Adhesive layer application on the back of the tile

Adhesive combed with notched trowel on support

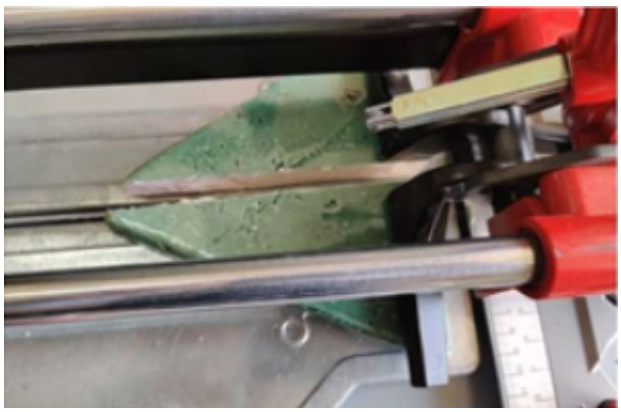
Tile laying

Tightening of tile joints

8.5. Cutting and drilling operations

Cutting and drilling operations in terracotta tiles are carried out in the same way and using the same tools and technology as for **any other type of tile**.
The success of cutting operations depends largely on having properly staked out the area to be tiled in advance, since this avoids narrow strips and pieces with geometries that are difficult to manufacture or which cause additional stress on the ceramic tile. For example, L-shaped pieces with narrow strips, junction boxes or drains in an area near the perimeter of the piece, etc.

Pieces cutting



Pieces cutting with grinder

8.6. Applying the adhesive

When laying ceramic tiles with adhesives, always bear in mind the characteristics of application of the adhesives used (open time, useful life, maximum application thickness, etc.), as well as the manufacturer's instructions included in the corresponding technical specifications or data sheets.

The process of laying terracotta tiles should follow the following guidelines:

• We recommend wetting the clay tiles prior to installing them before gluing the pieces, make sure that the back of the piece has no material debris of any kind. This debris should be removed beforehand in order to prevent the adhesion from being affected by this layer of dust.

• To install cladding tiles that are smaller than 20×20 and thin, choose an approximately 8 mm trowel.

• Spread only enough adhesive to allow for laying the tiles within the adhesive's open time period; i.e. before a non-stick surface film can form on it.

• First, spread the adhesive on the substrate using the smooth edge of the trowel.

• Comb the adhesive with the notched part of the trowel over the substrate, always in a straight line, perpendicular to an edge of the tile, parallel to the shortest side.
• When specified in the project, or in the cases described in the previous section, the double gluing technique should be used.

• Set the tile more or less in its final position, taking the width of the tile-to-tile joint into account.

• Move the tile in a direction perpendicular to the grooves and opposite to the adjacent tile, at a distance equivalent to the width of a trowel notch.

• Then move the tile in the opposite direction back to its initial position, adjusting its location with respect to the adjacent tiles and the tile-to-tile joint.

• The laying of the tiles on the adhesive layer by means of this reversible sliding movement squashes the adhesive beads, allows air to escape, and favors a better and more complete contact between the adhesive and the ceramic tile, improving the wetting capacity.

• With the tile in place and the adhesive fresh, tap gently to adjust the piece into its final position and form a uniform and well-compacted layer of adhesive. To do this, use a rubber mallet (preferably white) or a wooden planer with a rubber surface.

• Once the piece is located in its final position, the gap with the adjoining piece is adjusted with spacers.

Humedecido de baldosas

Adhesivo sobre soporte de colocación

• After laying a set of tiles, visually check the appearance of the work carried out, its flatness, uniformity and the regularity of the joints.

• If you see any piece in an incorrect position, correct it within the adhesive's adjustment time. After this time, forcing the piece into place will cause the adhesive bond to break or deteriorate.

• Any excess adhesive must be cleaned from the tile-to-tile joints before the adhesive sets.

• The adhesive must be protected from rapid drying and the presence of moisture, and premature traffic on the flooring should be avoided.

• Spacers ("crosshead" type, T-shaped, etc.) used where appropriate to ensure that the joints are straight and of a uniform width, must be applied when laying the tiles and must be removed before proceeding with grouting.

Adhesive Application in the back of the tile

Tile laying

8.7. Execute of the tile-to-tile joints

Grouting is the final step of ceramic tile installation. The ultimate appearance and durability of the tilework depends largely on proper preparation, application of the material and subsequent cleaning.

In the case of terracotta tilework, the joint plays an even more important role.

Tile-to-tile joints must be uniform in texture and color, free of cracks and efflorescence, and as low-maintenance as possible throughout the useful life of the tiled surface.

Before proceeding with grouting, we must ensure the proper preconditions:

• The joints must be dry, free of debris and free of adhesive, at least 2/3 of the tile thickness, and the thickness of the filing must be as uniform as possible for the entire tiled surface.

• The crossheads and other plastic separation devices between pieces must be removed before starting to fill the tile-to-tile joints.

The grouting material must be applied according to the manufacturer's instructions.

Grouting should begin after the grouting time indicated by the manufacturer, after laying the tiles and under controlled environmental conditions.

An suitably stiff rubber trowel for the width of the joint should be used to spread the material diagonally with respect to the joint pattern.

This operation fills and presses the material evenly over the full depth and length of the joint and prevents the edge from penetrating the joint and removing the deposited material again.

Special care should be taken to fill the joints in the same direction in order to avoid gaps or pores in material at the junction of grouting directions.

Optionally, a subsequent intervention can be performed with a jointer trowel or equivalent tool to equalize the curvature and provide the definitive relief and texture.

When using grouting materials of a contrasting color to the tiles, we recommend performing a preliminary test to confirm how easily the material can be cleaned from the surface.

Wetting of pieces prior to grouting

Joint cleaning

Caulking Gun Filler

Joint sealing with grouting material

Llaguero for removal of excess grouting material

8.8. Cleaning the grout

Cleaning the grouting material is essential for a good finish. Once the joints have been filled, the entire tiled surface must be cleaned with water.

For cementitious grouting materials, the time suggested by the manufacturer must be respected before the cleaning begins. The environmental conditions must also be assessed. With terracotta tiles, the behavior of the grouting material must be verified, since the absorption of the clay is high (>10%), which can dehydrate and prematurely dry the applied mixture of material.

The cleaning can begin once it is confirmed that the material does not stick to the fingers when touched.

The first wet cleaning serves to smooth the grouting material, shaping the profile of the joint and promoting the hydration of the cement, which is very important with very wide joints.

The cleaning must be done with adequately stiff sponges attached to hand floats, moving them diagonally to the joint pattern or in circular movements.

The dragging of material from the surface of the joint must be avoided, as this causes an excessive emptying of material from inside the joint.

The sponge must be rinsed and wrung out with each pass, and the rinse water must be changed frequently.

It is important to wring out the sponge and avoid adding an excessive amount of water on the joint, which may cause softening and subsequent emptying.

Wet cleaning in controlled phases is recommended when the joint begins to dry in order to avoid premature hardening and changes in color tone.

A successful **first cleaning** will make for an easier final cleaning of the tilework, and it will prevent any hardened materials from remaining on the surface.

To finish, a **second pass** will be made after the first rough cleaning. This will be done with the sponge wrung out diagonally to the joint pattern in a straight line and passing only once in each section.

After each pass, **the sponge should be cleaned** in the bucket and wrung out again, and as before, **the water should be changed periodically**.

It is advisable to finish the task of grouting a complete room with a fresh **final cleaning** using clean water applied with a well wrung out mop or similar.

After the final cleaning, it is important to r**espect the stipulated time before being put into service**, especially with flooring.

Cleaning grouting material with a sponge

Preview of final cleaning

The good results of the grouting and subsequent cleaning must be supplemented by the **FINAL CLEANING OF THE WORK** as detailed in todobarro's Cleaning and Protection Guide.

9. Some general observations

9.1. Frost resistance

Resistance to freeze-thaw cycles is a characteristic required of ceramic tiles only in outdoor locations where there is a risk of frost. **Passing the frost resistance test** according to the UNE-EN 10545–12 standard is a **minimum** requirement **but not sufficient** to ensure durability against this phenomenon.

The frost resistance of ceramic tilework cannot rely exclusively on choosing the right ceramic tile; the following conditions, at minimum, **must also be met**:

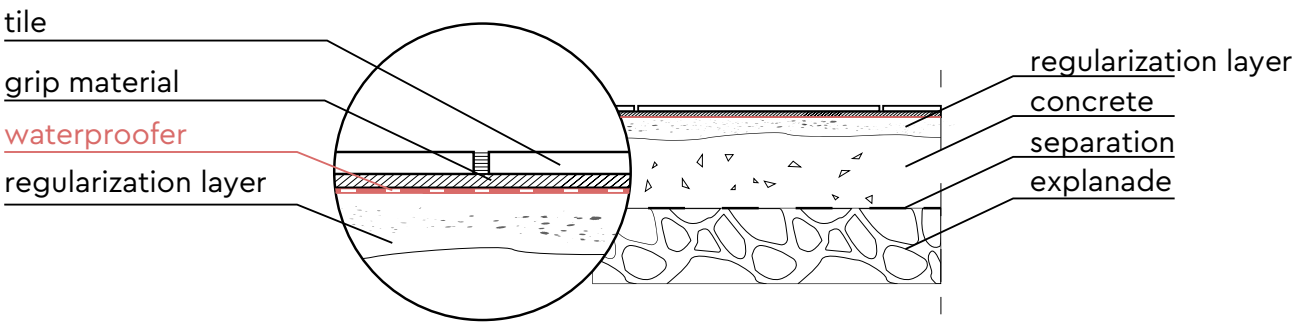
- Tiles must be fully and evenly bonded to the substrate.

- A drainage or waterproofing system must be implemented to avoid saturation of the screed layers and the back of the tiles.

- The movement joints must be increased, which will prevent the tiled surface from opening up and allowing water to seep into the intermediate layers.

- Grouting material with low water absorption must be used.

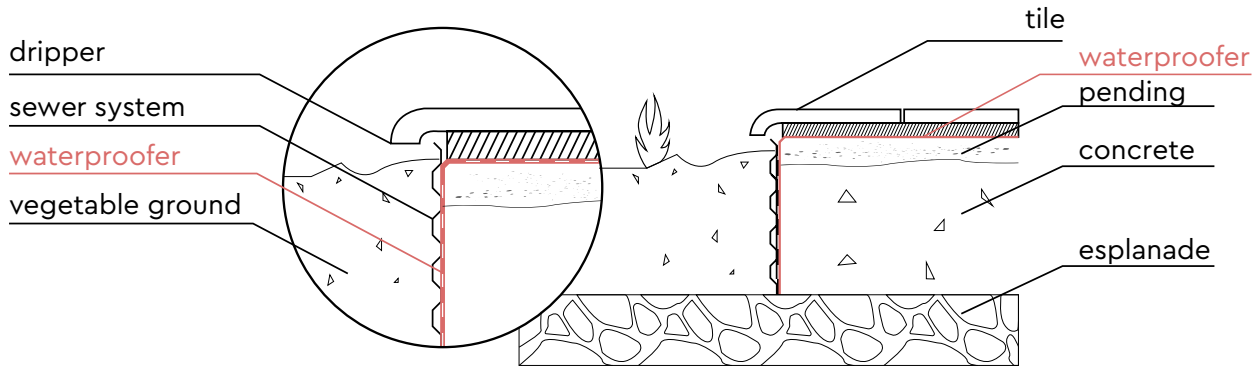
In areas that are wet and/or at risk of frost, flooring must be executed with a slope of at least 1,5% to **prevent standing water**, and adequate drainage and gutter systems must be in place to drain the expected water.



Exterior pavement waterproofing detail
(S/ UNE 138002:2017)

9.2. Joining point of the clay tiles/ground

In clay systems installed over a resurfaced or extended area (for example sidewalks, pathways, etc.) water penetration through the side surfaces of the system entails seriour durability risks for the system itself, due to the persistent damp in the area. In this case we recommend waterproofing the contact surface between the base/ extension of the pavement and the ground. A proper drainage system should be installed that will prevent water from penetrating beneath the clay flooring



Exterior pavement detail with risk of frost
(S/ UNE 138002:2017)

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