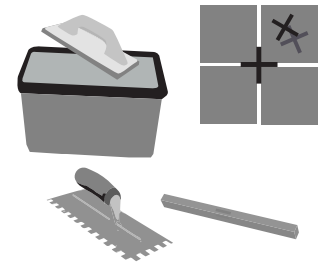


# TINO

STONE & SURFACES

NATURAL STONE INSTALLATION GUIDE

It is important to choose the right tools and equipment for the installation: radial machine or water cutting table with diamond disk to avoid material chipping, toothed trowel, level, white rubber pot, rubber trowel for grouting, crossheads for joints and suitable containers.



Depending on the absorption of the material, the color of the material, the characteristics of the support and the application, a suitable adhesive must be chosen.

TINO, as a precautionary measure, does not recommend in any case the use of mortars with sand as adhesive, since sand contains salts. When the cement is mixed with the sand and diluted in water, the salts dissolve in the mixture and are absorbed by the porosity of the stone and can produce pathologies called efflorescence. This risk is greater for more porous materials (with greater water absorption).

The main recommendations for tile adhesives (adhesive cements) that are made in the ISO 13007 and UNE-EN 12004 standards, referring to the different types of natural stone that are most commonly used or to common work situations can be seen in the following table:

ADHESIVE	DESCRIPTION	MATERIAL TYPE	APPLICATIONS	COMMENTARY
<b>C1</b>	Normal cementitious adhesive	Types of stone with porosity: <b>limestone, sandstone</b>	Normal interior flooring	Conventional-low performance adhesion is only mechanical
<b>C2</b>	Improved cementitious adhesive	All types of stone: <b>marble, granite, limestone, sandstone, etc.</b>	Interior flooring, Interior cladding	Better performance than C1. The adhesion is mechanical and chemical
<b>C2S1</b>	Improved deformable cementitious adhesive	All types of stone: <b>marble, granite, limestone, sandstone, etc.</b>	Exterior flooring, exterior cladding, large formats	For applications where contractions and expansions occur and/or for large tile C2S2 formats
<b>C2S2</b>	Improved highly deformable cementitious adhesive			
<b>C2E</b>	Improved cementitious adhesive with extended installation time	All types of stone: <b>marble, granite, limestone, sandstone, etc.</b>	Interior-exterior flooring, interior, exterior cladding, large formats	For complex applications where it takes longer than normal for the piece to be installed from the time the cementitious adhesive is applied
<b>C2T</b>	Improved cementitious adhesive with reduced slippage or sagging	All types of stone: <b>marble, granite, limestone, sandstone, etc.</b>	Interior and exterior cladding	For applications where sagging cannot occur during setting

**COMBINATIONS OF THE ABOVE C2XXXX DESIGNATIONS FOR PRODUCTS WITH COMBINED PROPERTIES**

<b>R</b>	Adhesive of reactive resins. In some cases union bridges	All types of stone: <b>marble, granite, limestone, sandstone, etc.</b>	Fiberglass or mesh reverses	In general, when circumstances occur that prevent the correct adhesion of c2 cementitious adhesives. Follow the instructions of the manufacturer of reactive resins or bonding bridges and test previously the resulting adhesion with the final materials to be used
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**The color of the cementitious adhesive used should be as similar as possible to the color of the material to be bonded, especially in porous materials.** Otherwise, there could be some change in the appearance or color of the stone.

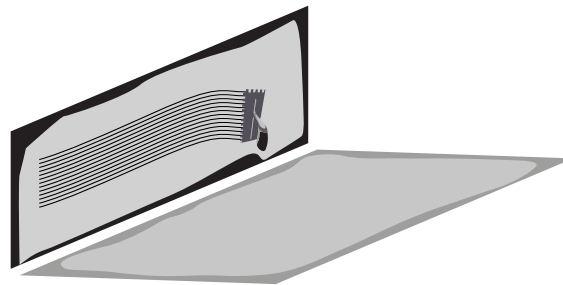


**COLOR  
ADHESIVE = STONE**

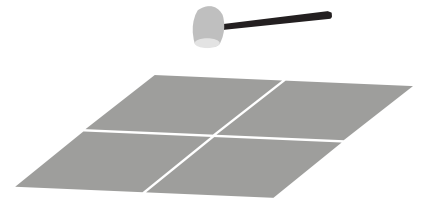
It is necessary to glue the pieces of Natural Stone using the double gluing system with a special cementitious adhesive for this application. The adhesive should always be used following the instructions indicated by the manufacturer, especially those related to the water/adhesive ratio.

The double gluing system consists of spreading the product on the support and combing it with a notched trowel to regularize the thickness and ensure a good distribution of the adhesive over the entire surface.

On the back of the material spread a layer of adhesive and comb with the trowel, in order to ensure 100% contact of the back of the piece with the support's grip material.



**Place the pieces by pressing them with the white rubber pot until the grooves created with the toothed trowel are completely flattened in the grip material and the pieces are leveled.**



The action of the grouting consists of filling in the gaps left between pieces, called joints. **The separation joints must be clean of mortar residues and dirt**, thus improving the adhesion of the joint material and increasing its effectiveness.

The main recommendations for grout in the EN 13888 standards can be seen in the following table:

ADHESIVE	DESCRIPTION	MATERIAL TYPE	APPLICATIONS	COMMENTARY
<b>CG1</b>	Improved cementitious grouting material	Stone with porosity. Water absorption greater than 3%.	Interior flooring and plating	Conventional-low performance. Adhesion is only mechanical
<b>CG2</b>	Improved cementitious grout with reduced water absorption	Any type of stone, especially for those with water absorption less than 3%	Indoor and outdoor flooring and cladding	Better performance than C1. The adhesion is mechanical and chemical
<b>CG2 W</b>	Improved cementitious grout with increased abrasion resistance	Any type of stone	Indoor and outdoor flooring and cladding	Especially where waterproofing and also vapor diffusion capability is required (allows water vapor to pass through)
<b>CG2 A</b>	Improved cementitious deformable grout	Any type of stone	Indoor and outdoor tiling.	Especially where high traffic conditions occur or where it is necessary to provide the grout with improved abrasion resistance
<b>CG2 S1</b>	Improved cementitious adhesive with extended installation time	Any type of stone	Indoor and outdoor tiling.	Especially in installations where shrinkage and expansion of parts or large format parts occur
<b>CG2 S2</b>	Improved cementitious adhesive with reduced slippage or sagging			

**COMBINATIONS OF THE ABOVE CG2XXXX DESIGNATIONS FOR PRODUCTS WITH COMBINED PROPERTIES**

<b>RG</b>	Reactive resin grouting material	Any type of stone Indoor flooring and cladding.	Format limitation according to deformability recommended by the manufacturer.	Especially where high mechanical and chemical resistance and high impermeability to water and water vapor are required (does not allow the passage of water vapor). High resistance to stains.
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TINO recommends leaving a **minimum joint between pieces of 2 mm indoors and 5 mm outdoors**, in order to absorb any expansion or contraction caused by differences in ambient temperature and, of course, respecting the construction joints, both perimeter and structural.

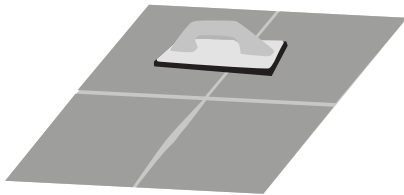


\*All recommendations made by the glue cement manufacturer must be respected.\*

**We must always apply the joint material after 24/48 hours from the end of the application of the coating**, depending on the weather conditions, to let the water used in the mixture of the coating bonding material evaporate and thus avoid possible moisture stains that over time could cause efflorescence pathologies.



**24H / 48H**

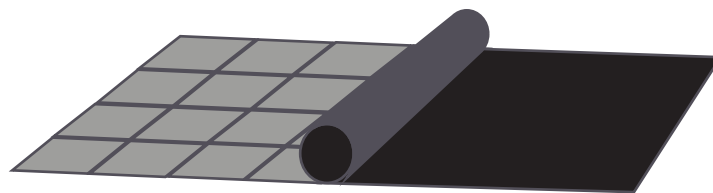


The grouting material will be applied **with a rubber trowel or spatula and will always be applied in the joint hole**. Never use the traditional method of grouting, which consists of extending the grout throughout the coated surface, because due to the porosity of the stone could cause incrustations in undesirable places, making it difficult to clean later.

The removal of grout residues should not extend from application to cleaning. **A damp sponge should be used for removal**, so that incrustations in undesirable places are avoided.



When laying floors that are not going to be polished on site, but are already installed with the finished surface (polished, honed, etc.) **It is recommended to protect the coated surface until the total completion of the work** in order to facilitate cleaning and not to damage the installed Natural Stone.



For the application of post-installation treatments, such as waterproofing, **the drying and curing of the installation cementitious adhesives and grouts must be waited for, in addition to the pre-drying of all the lower layers indicated in the Substrate Preparation Manual**. In this way, interference of the humidity released during drying-curing with the products applied after installation will be avoided.

**The drying-curing times of the adhesive cements and grouts will be those indicated by the cement manufacturers for the environmental conditions on site.**

*\*All recommendations made by the glue cement manufacturer must be respected.\**

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