



installation guideline

The following installation guidelines apply to all marble tiles from 12" x 12" to 24" x 24", for both horizontal and vertical applications. Please note specific instructions for interior and exterior application.

PRODUCT and INSTALLATION

SPECIFICATIONS

Marble are natural stone products. Due to their natural characteristics it is important that the proper installation materials and methods are used. The stone is to be installed per industry standards and applicable building codes.

Installation materials should be specified as part of a single source installation system from a manufacturer of stone installation products that will provide a minimum of a 10-Year Labor & Material Warranty for the intended application. The thin-set adhesive should be either an ANSI A118.4 Latex-Portland Cement Mortar or its rapid setting version, if needed. Use an ANSI A118.3 epoxy adhesive for moisture sensitive

stones. For freeze-thaw conditions verify the suitability of the stone per ASTM C666.

SUBSTRATE

We recommend that you install marble over a clean, sound, and flat concrete or mortar substrate with a steel trowel and fine broom finish. The surface should be free of contaminants or any condition that could compromise the bond of the tile, particularly form releases and curing compounds.

Deflection of concrete substrate should not exceed $L/360$ for horizontal surfaces or more than $L/600$ for vertical applications, and should be approved by a structural engineer. For wood subfloors deflection is not to exceed $L/720$. Floor configurations shall conform to the IRC for residential applications, and IBC for commercial applications. Mortar bed applications must comply with ANSI A108.1. Tiles installed using a wet-set mortar method must use only dry pack mortars that are fully compacted.

Concrete surfaces should be scarified to remove contaminants and open the pores of the concrete to allow for moisture absorption. The surface should be power washed after scarifying to ensure it is clean.

Select a suitable installation application as recommended by the current TCNA Handbook for Ceramic & Natural Stone Tile Installation and the MIA Dimension Stone Design Manual. For exterior applications to Cementitious Backer board units over stud framing, comply with the material manufacturer's requirements to be part of the 10-Year Labor and Material Warranty. Substrates should be free of cracks. Use the installation material manufacturer's membrane for crack isolation and waterproofing protection.

PREPARATION

Prior to installation, examine the areas to be covered and notify the general contractor or owner representative in writing of any visually obvious defects or conditions that would prevent a satisfactory installation. Work should not proceed until satisfactory conditions are provided. Before starting, the surface to be tiled should be cleaned/scarified to remove curing compounds, form releases, sealers, oil, laitance, or any type of contaminate that would interfere with bonding. All rough, uneven or "out-of-plumb" surfaces should be made flat, "plumb and true" to within 1/8" in 10' (3mm in 3m) and 1/16" in 1' (1.5mm in 300mm).

1-2 days or longer with larger rooms, as well as 3-4 days for drying

Materials Required

- Marble Tile
- Cement Board
- 1 1/4" cement board screws
- Line Chalk
- Mortar
- Notched Trowel
- Tape Measure
- T Square
- Tile Spacers
- 2X4 Wood
- Rubber Mallet
- Marble Sealer
- Grout
- Grout Float
- Foam Brush
- Work Gloves
- Wet Saw (Or custom cut pieces)

You want to make sure that the subfloor is completely flat and free of divots, defects, or bumps. Raised areas may need to be sanded down and dips may need to be repaired with filler. Getting the subfloor perfectly smooth is vital to the integrity of the entire floor installation, because any gap between surfaces will be a weak point that can lead to damage.

Before you can lay marble tile you need to install cement board or some other form of vapor barrier underlayment which will block the penetration of liquids which can damage the floor. Thin set mortar can be spread directly on a plywood subfloor with a notched trowel. The cement board sheets are placed one at a time, and are fastened using 1 1/4" screws.

MOVEMENT JOINTS

Locate, design, and install expansion joints per the current version of TCNA EJ171 Industry recommendations. Existing joints in the subsurface must be carried through tile work. Movement joints should be installed at all "changes of plane" in the tile work and where tile abuts restraining surfaces, at every 20' to 25' for interiors and 8' to 12' in each direction for all exterior and interior areas exposed to direct sunlight or moisture. Expansion joints should be a minimum 3/8" wide for joints placed 8' on center, and a minimum 1/2" wide for joints placed 12' on center. For exterior use, follow TCNA EJ171 guidelines for severe climatic conditions. Use an appropriate ASTM C920 sealant and install it with primer and backer rod per the manufacturer's directions.

WATERPROOFING AND CRACK ISOLATION MEMBRANES

A waterproof membrane should always be applied over the substrate prior to installing the stone to minimize water penetration, the risk of efflorescence, and spalling. Additional waterproofing protection is required in all wet and exterior areas. A moisture barrier is required behind a mortar bed or cementitious backer units when used over structural framing. Where necessary, a crack isolation membrane should be used to either isolate existing shrinkage cracks in the substrate or to provide protection against future substrate cracking. Do not install over structural cracks. When using limestone or marble in a shower, get approval from the installation product's manufacturer. Use only membranes as supplied by the installation manufacturer for single source responsibility that is part of the labor and material warranty. Observe all manufacturer requirements for exterior applications.

INSTALLATION OF TILE

You want the marble tiles that you install to radiate outwards from the center of the room, rather than starting abruptly from one of the walls. In order to achieve this effect, you need to draw a reference line on the surface of the underlayment. Find the center of two opposing walls and use a line chalk to draw a path in between them. Then measure to the center of that line, and use a T square to make an intersecting chalk path to the other two opposite walls. This gives you the center of the room while also dividing it into 4 neat quadrants.

Mix thin set mortar according to the manufacturer's instructions. Only mix a little bit at a time, and make more when necessary. Using a notched trowel, begin to spread the adhesive onto the floor, starting at one of the corners where your reference lines intersect in the center of the room. As you work, use the notched edge of the trowel to create grooves in the mortar. This will increase the adhesive strength of the bond with the bottom of the marble.

On marble tiles that are 12" square in size or smaller a 1/4" notched trowel will create large enough grooves. However, if you have much larger tiles, or if you are using irregular tumbled or natural cleft materials,

then you will want to use a 1/2" notched trowel to create larger, deeper grooves in the adhesive.

Spread enough mortar to easily cover the bottom of a single tile, and make sure that its entire surface is notched. Then take the first tile and gently press it into place, being careful to line its corner up with the point where the two chalk lines intersect. As you press it down, twist the tile slightly in order to ensure that it properly sets in the mortar bed below.

A rubber mallet is a large hammer that is made with a soft rubber head. This can be used to lightly tap the surface of the marble tile, in order to press it more firmly into the mortar. However, you want to be careful not to tap too hard, as marble is a relatively soft material, and it can crack rather easily. You also want to avoid moving the tile as you are setting it.

Continue to work, spreading enough mortar for one tile, then placing it, before moving on to the next one. Follow the reference line towards the wall, using it as a guide to keep your placement straight. The use of tile spacers between each piece will help you to keep grout lines sharp and consistent as well.

Once you reach the wall take note of any gaps that may require custom cut pieces. Then move back to the reference line, and continue to place tiles adjacent to the first row. Take a moment after every few tiles to ensure that all of your lines meet up, and the entire floor looks sharp and consistent. As you work be aware that it is inadvisable to step on a marble floor tile for at least 48 hours after installation. Because of this you have to be careful not to tile yourself into a corner that you cannot escape from. Work on the quadrant that has the door last, and as you set tiles make sure that you leave rows open for yourself to escape through. Once you get three or more tiles in place next to one another, you can use a 2x4 to ensure that they all have an even height set into the mortar. Place the wood on the floor, stretching across the tiles. If the marble is polished, you may want to cover the front of the wood with a piece of carpet to prevent scratches. Just ensure that the surface remains flat and consistent. Then, lightly tap the middle of the wooden plank with a rubber mallet. As it goes down both sides will also go down, ensuring that all of the tiles have a consistent level. This can be done across multiple rows as you work.

In most marble flooring installations, you will need custom cut pieces in order to stretch

the floor out to meet the walls. You will also need to fit tiles around architectural features in the room, as well as permanent appliances and equipment. The way to do this is with the use of a wet saw.

A small wet saw will cost around \$100 dollars, and will be able to handle basic straight cuts on 12" tiles or smaller. Larger commercial saws are also available which can cut much larger, thicker materials. In some cases, you may be able to rent a wet saw for the day from a local hardware store.

A wet saw works by spraying water on the material, as you run it through a spinning table saw blade. The water helps to keep the blade cool and the cuts smooth as it moves through the marble. With a basic wet saw you will only be able to make straight cuts, slicing tiles into smaller squares or rectangles. There are also pieces available that can assist in the cutting of diagonal triangle shaped pieces.

Marble is a very delicate material and you have to move very slowly as you cut each piece. It is very easy to end up cracking, damaging, or completely shattering a tile that you are trying to make a tiny cut on. For this reason, some people prefer to measure the floor and purchase materials already cut up by the supplier. This is

especially true if you need round or angled pieces cut into the material.

You want to use enough mortar so that you can create notches in it with the trowel, without seeing bare cement board. You then want to set the tile with enough force that it collapses those gaps, but not so much that it forces the mortar up through the grout lines. If excess adhesive does spew up through the cracks it needs to be removed using a paint stick or a utility knife. You need to wait for the mortar to dry completely before moving on. Follow the manufacturers recommendations on this, although the process can sometimes take as long as 48 hours. During that time nobody should be allowed to walk on the floor, or you will risk moving or depressing a tile.

Install stone tiles per installation product manufacturer's instructions and to meet industry standards per ANSI A108, TCNA Handbook for Ceramic & Natural Stone Tile Installation, and Marble Institute of America Dimension Stone Design Manual Standards. Contact the manufacturer of installation products to identify which products to use for the intended interior or exterior application. Use a polymer modified white thin-set mortar or rapid setting thin-set

mortar complying with A118.4 for installing limestone and marble tile. For concerns with dimensional stability the rapid thin-set selected for installing this stone must achieve a "Class A rating," when tested according to the Modified British Standards (BS) EN 14617-12 Dimensional Stability Test within the first 24 hours.

Fiberglass Mesh-backed Marble: An ANSI A118.3 epoxy adhesive is recommended for installation of marble tile that is reinforced with fiberglass mesh. The Marble Institute of America also recommends an epoxy mortar for any fiberglass mesh-backed marbles. See the Installation/General Information section 11.4.1 of the Dimension Stone Design Manual.

Clean the back of the tile and the substrate during the installation process leaving it damp, but do not leave it wet. The thin-set adhesive must be applied to the surface to be tiled and to the back of the tile with the flat side of a trowel using a firm scraping motion to key the thin-set into the surface to be covered. While the thin-set applications are still tacky, back-butter the tile with more thin-set to ensure substantially 100% thin-set coverage and full contact between the tile and substrate (no thicker

than 3/8" compressed). Only apply as much thin-set to the substrate that can be covered with tile without the thin-set skinning over. Set the tile into the setting bed of thin-set, and beat and slide it into place to ensure full contact and an in-plane surface with adjacent tiles. Remove freshly installed tile to ensure substantial 100% thin-set contact. Tiles should be aligned to achieve uniform grout joints and to avoid lippage. Thin-set should be allowed to set until firm before grouting. Excess thin-set must be cleaned from the tile surface and grout joints while the thin-set is still fresh.

GROUTING

If necessary, prior to grouting apply an appropriate breathable stone sealer or grout release, suitable for the respective stone and interior or exterior use, to the tile to facilitate cleaning and for protection against staining from contrasting color grouts. Grout joints should be packed full and free of all voids and pits. Excess grout should be cleaned from the stone surface as the work progresses, before the grout hardens. Cure grout per grout manufacturer's instructions. Do not use acids to clean off excess grout. Prior to grouting, test an area to make sure the stone surface will not scratch.

Follow grout manufacturer's recommendation for the use of sanded or un-sanded grout, which is determined by the width of the grout joint.

When mixing grout make sure that you follow all of the manufacturer's recommendations.

As with the mortar you only want to mix enough for about 15-20 minutes' worth of work, as any longer and the mix will start to dry out and harden. The grout can be applied to the joints using a grout float. Try to direct as much of the mix into the grooves as possible, and wipe up any excess that gets on the tiles.

Use a large sponge that is slightly damp to gently wipe the surface of the marble tiles clean of any excess grout. As you work be careful not to allow any moisture to seep down into the grout lines, as this can cause the mix to become muddy and washed out. You also do not want to inadvertently swipe some of the grout mix out as you work with the sponge. Allow the grout to dry for at least 4 hours.

Once the grout feels completely dry to the touch you want to seal the entire floor again. Even though you already sealed the tiles, the grout lines are also susceptible to stains and moisture penetration, and so

they need a protective surface coat as well. It is also a good idea to seal a marble floor several times after installation, waiting for each successive coat to dry before applying a new one. This will create a strong protective layer over the surface of the material.

If you have polished marble then you want to use a very thin coat of seal, applied with a foam brush. Smooth away any puddles or tiny bubbles that appear in the surface, as they can dry into permanent features. The surface of tumbled and honed marble will be more forgiving, but the same rules apply there as well.

You will need to reapply this sealant to the marble every 6-12 months depending on how much traffic the room gets.

SEALING

After the stone is installed, grouted, and properly cured, seal the stone with an appropriate high quality breathable stone sealer, suitable for exterior or interior use as appropriate, to minimize water absorption, efflorescence, and potential staining. If necessary, apply an anti-graffiti coating that is compatible with the stone. Follow sealer manufacturer's installation instructions. Reseal tile as recommended by sealer manufacturer.

Marble may seem like it is a very hard, solid material. It is rock after all. But in actuality marble is a very delicate flooring material that needs to be taken care of. Not only is it prone to cracking and chipping, but it is also very porous, and many materials can penetrate the surface of the stone causing permanent stains. That is why the next step you take has to be properly sealing the surface of the floor with a high quality marble surface sealing agent.

It is important to do this before you grout the floor, because the grout mix will slop around the grooves to some extent, and can end up causing stains in the marble. That is why you want to ensure that the material is protected before moving on, despite the fact that you will have to seal the grout lines as well at a later time.

PROTECTION

Take precautions to protect the finished work from damage by other trades and traffic. Construction traffic should not be allowed on fresh tile or grout joints. Allow the grout to cure for a minimum of 7 days before aggressive use or steam cleaning. Maintain acceptable temperature ranges per thin-set manufacturer's requirements before, during, and after the tile installation. Protect the surface of the tile within 24

hours of its installation from rain or water saturation by covering per thin-set manufacturer's requirements.

MAINTENANCE

For interior surfaces, regular dust mopping or sweeping to remove grit and dirt is recommended. An appropriate mechanical method can also be used. Walk-off mats should be placed at door entrances to minimize wear on the tile and to provide protection against slipping during wet conditions. Use a neutral cleaner to scrub tile and grout. For floors, use a wet and dry vacuum to pick up dirty water after cleaning. On exterior surfaces, use a neutral cleaner to power wash tile and grout as needed. Proper maintenance will extend the beauty and functional life of the tile, as well as keep it safe for public use.

CLAIMS

We will only process claims on stone products that have been properly installed under industry standards and that qualify for a 10-Year Labor & Material warranty as provided by the tile installation product's manufacturer. We recommend that a quality control plan be implemented during the installation.

For more information: www.calacattatile.com