

INSTALLATION INSTRUCTIONS - TILE & STONE

General Guidelines

PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE INSTALLATION. IMPROPER INSTALLATION WILL VOID WARRANTY.

These are general guidelines for ceramic, porcelain, natural stone (marble, travertine, limestone and slate) and mosaic tile installed on floors, walls and exterior patios. Installations should follow current industry standards (TCNA Handbook and ANSI A108/A118) and the instructions of the setting material manufacturers (mortar, grout, membranes and sealers). Where product-specific instructions differ from these guidelines, the product-specific instructions prevail.

- Tile should be one of the last finishes installed in any new construction or remodel project.
- Inspect all materials carefully for color, shade, size, finish and defects before installation. Ensure adequate lighting for proper inspection. The warranty does not cover materials with visible defects once they are installed. If there are any doubts to the quality, dimensions or appearance of the tile **DO NOT INSTALL**. Please contact Tile Outlets of America as **INSTALLATION IS ACCEPTANCE**.
- Tile and natural stone are produced in batches. Check that every box carries the same shade/lot number and caliber (size) number before installation. Do not mix different lots in the same area.
- Order 10–15% more tile than the measured area to allow for cuts and breakage. Diagonal, herringbone and other patterned layouts may require more. Keep leftover tile for future repairs.
- Natural stone (marble, travertine, limestone, slate and similar) is a product of nature. Variation in color, veining, pits, holes, fissures and texture is normal and expected, and is part of the character of the stone. It is not a defect. Always blend tiles from several boxes.
- Confirm the tile is rated for where it will be installed. Tile sold as wall tile is not suitable for floors. Only tile rated for exterior use should be installed outdoors, and in freeze-thaw climates it must also be rated frost resistant. Refer to the product specifications for use rating, water absorption and slip resistance.
- While tile is water resistant, tile and grout are not waterproof. Water can pass through grout joints. Showers, tub surrounds, steam rooms and other wet areas require a waterproofing membrane or waterproof backer board system beneath the tile.
- Store boxes indoors, flat and fully supported, in a dry area protected from weather and freezing. Mortar and grout must also be kept dry and stored within the temperature range on the packaging.
- Most setting materials require air and surface temperatures between 50–90°F (10–32°C) during installation and curing. Follow the setting material manufacturer's requirements.

- It is the responsibility of the installer/owner to determine if the jobsite substrate and jobsite conditions are environmentally and structurally acceptable for tile installation. The manufacturer declines any responsibility for tile failure resulting from or related to the substrate, subfloor, structure, setting materials, jobsite damage or deficiencies after the tile has been installed.
- Cutting, grinding or drilling tile and stone creates dust that may contain crystalline silica. Cut wet wherever possible, work in a well-ventilated area and wear eye protection, gloves and a properly fitted respirator (N95 or better).

Substrates & Subfloors

- Tile can be installed over properly prepared concrete, cement backer board, approved uncoupling or waterproofing membranes, and structurally sound wood subfloors prepared for tile. Do not install tile directly over particleboard, hardboard, luan, cushioned vinyl or existing wood strip flooring.
- All substrates must be dry, clean (swept and vacuumed of any debris), structurally sound and free of wax, paint, sealers, curing compounds, adhesive residue and anything else that may prevent a bond.
- Flatness: for tile with all edges shorter than 15", the substrate must be flat within 1/4" (6mm) in 10 ft and 1/16" (1.5mm) in 2 ft. For large-format tile (any edge 15" or longer), flat within 1/8" (3mm) in 10 ft and 1/16" (1.5mm) in 2 ft. Use a cement-based patching or self-leveling compound to correct the surface. Do not use thinset mortar to level a floor.
- Deflection: floor structures must meet a minimum of L/360 for ceramic and porcelain tile and L/720 for natural stone. Excessive movement will crack tile and grout.
- Wood subfloors must be a minimum of 5/8" exterior-grade plywood or OSB over joists spaced no more than 16" on center, covered with cement backer board or an approved uncoupling membrane. Natural stone over wood requires a second layer of plywood or a membrane system rated for stone. Screw every 6-8" along joists to eliminate movement and squeaks.
- Crawl spaces must be a minimum of 18" (46cm) from the ground to the underside of floor joists. A ground cover of minimum 6 mil black polyethylene film is essential as a vapor barrier, with joints lapped 6" (15cm) and sealed with moisture resistant tape. Where necessary, local regulations prevail.
- Concrete must be cured for a minimum of 28 days, be free of hydrostatic pressure and be tested for moisture. Use a crack isolation membrane over existing non-structural hairline cracks. Do not tile over structural cracks or cracks with vertical movement. Existing control joints in the slab must be carried through the tile as movement joints.
- To install over existing ceramic tile, check that it is well bonded and flat. Clean and scarify the surface and use a bonding primer or mortar approved for tile-over-tile. Do not sand or grind existing resilient flooring as it may contain asbestos. Take proper precautions and contact an asbestos abatement company to remove old flooring.

- Walls in dry areas may be gypsum board. In showers and other wet areas, use cement backer board or foam board with a waterproofing membrane (ANSI A118.10), or a listed waterproof board system. Do not use drywall or “greenboard” in showers. Do not install a polyethylene vapor barrier behind a board that also has a surface-applied membrane.

Setting Materials

- Use a polymer-modified cement mortar (thinset) meeting ANSI A118.4 or A118.15 for most porcelain, ceramic and natural stone. Use a large and heavy tile (LHT) mortar for large-format tile.
- Use white mortar for white or light-colored marble and limestone, and for glass or translucent mosaics. Grey mortar can show through or discolor these materials.
- Some natural stone (such as green marble and certain limestones) is moisture sensitive and may warp, curl or stain with water-based mortars. Use a rapid-setting or epoxy setting material as recommended by the stone supplier.
- Do not use premixed mastic or organic adhesive on floors, in wet areas, outdoors, or with large-format tile, natural stone or glass.
- Use sanded grout for joints 1/8” and wider and unsanded grout for joints narrower than 1/8”. Sanded grout will scratch polished stone and glass, so use unsanded grout on marble and glass mosaics. Only use epoxy grout on glass mosaics if the mosaic manufacturer approves it. Use grout rated for exterior use on patios.

Installation Requirements

- Tools needed: tape measure, chalk line, level, straight edge, notched and margin trowels, drill with mixing paddle, buckets, spacers or tile leveling system, wet saw or tile cutter, rubber mallet, grout float, sponges and safety equipment.
- BEFORE installation inspect all materials carefully for color, shade, size, finish and defects before installation. Ensure adequate lighting for proper inspection. The warranty does not cover materials with visible defects once they are installed. If there are any doubts to the quality, dimensions or appearance of the tile **DO NOT INSTALL**. Please contact Tile Outlets of America as **INSTALLATION IS ACCEPTANCE**.
- Install tile from several boxes at one time to ensure a good color and shade mix.
- Mortar coverage must be a minimum of 80% for interior dry areas and a minimum of 95% for wet areas, exterior installations and all natural stone, with all corners and edges fully supported. Lift a tile periodically to check coverage.
- Back-butter (apply a thin layer of mortar to the back of the tile) for all natural stone and any tile with an edge 15” or longer.
- Never butt-joint tile. Minimum grout joint width is 1/16” for rectified tile and 1/8” for non-rectified tile. Handmade, tumbled or ungauged stone may need wider joints.

- For plank-shaped tile (any edge 18" or longer), use an offset of no more than 1/3 of the tile length unless the manufacturer specifies otherwise, to reduce lippage (uneven edges).
- Door jambs are recommended to be undercut. Allow for the finished height of tile, mortar and any membrane at doors, transitions and appliances.

Installation

1. First, plan the layout. Find the center of the room and "dry lay" tiles from several open boxes in both directions to check the pattern, blend shades and avoid cuts smaller than half a tile at walls and doorways. Snap square reference lines with a chalk line. It is the installer's responsibility to confirm the finished look meets the end user's expectations.
2. Mix mortar to the consistency on its packaging, let it rest (slake) as directed, and remix. Do not add water once the mortar starts to set.
3. Spread mortar with the flat side of the trowel to key it into the substrate, then comb with the notched side in straight lines in one direction (not swirls). Choose a trowel size that achieves the required coverage for your tile size. Only spread as much as you can cover before the mortar skins over.
4. Set each tile and move it slightly back and forth across the trowel lines to collapse the ridges. Use spacers or a leveling system, and check for level and lippage as you go. Clean mortar out of the joints while it is still wet, leaving at least 2/3 of the joint depth open for grout.
5. Cut tile with a wet saw or tile cutter, and use an angle grinder with a diamond blade for curves and notches. Wipe cut tiles dry before setting them. Smooth or polish any cut edge that will be exposed, or finish exposed edges with bullnose or trim pieces.
6. Allow the mortar to cure before grouting or walking on the tile, typically a minimum of 24 hours. Follow the mortar manufacturer's cure times.
7. **Grouting:** remove spacers and clean the joints. Apply a sealer or grout release first to natural stone, polished porcelain and porous or unglazed tile. Pack grout into the joints diagonally with a rubber float, then drag the float diagonally across the joints to remove the excess. Clean with a damp, well-wrung sponge before grout dries on the tile face, taking care not to pull grout out of the joints, and buff off the haze once cured. Test colored grout on a spare piece of stone first, as pigment can stain porous stone.
8. **Sealing:** once the grout has cured (typically at least 24 hours), make sure the surface is clean and dry, then seal natural stone and cement grout with a penetrating sealer made for the material. Choose a natural sealer to keep the material's current color, or an enhancing sealer to darken and enrich it. Both come in solvent-based and water-based formulas. Test the sealer on a spare tile first, because the enhanced look is permanent. Porous stone may need more than one coat. Follow the sealer manufacturer's directions.
9. **Finishing the installation:** fill all perimeter and movement joints with a flexible sealant (not grout), then install baseboard, trim and transitions. Nail moldings to the wall, not through the tile.

Movement Joints & Transition Requirements

- Leave a minimum 1/4" gap around the room perimeter and where tile meets walls, columns, tubs, cabinets, pipes and other materials. Fill with a flexible sealant, not grout.
- Interior floors need field movement joints every 20–25 ft in each direction, reduced to every 8–12 ft where tile is exposed to direct sunlight, moisture or heated floors.
- Exterior installations need movement joints every 8–12 ft in each direction.
- All changes of plane (floor to wall, inside wall corners, shower corners and countertop to backsplash) must be filled with a flexible, color-matched sealant, not grout.
- Honor all structural joints and control joints in the substrate by carrying them through the tile.

Marble, Travertine & Limestone

- These calcium-based stones are softer and more porous than porcelain and are easily etched by acids. Do not use acid-based grout haze removers or cleaners on them at any stage.
- Seal before grouting, especially honed, brushed or tumbled finishes, to help prevent grout from staining the surface or filling the texture. Test the grout and sealer on a spare tile first.
- Unfilled travertine will accept grout into its holes. Filled travertine may lose small amounts of fill over time; this is a natural characteristic and can be refilled.
- Use white mortar for light-colored stone, achieve 95% coverage and back-butter every tile. Use unsanded grout, as sanded grout can scratch marble.
- Stone thickness can vary, especially in ungauged or tumbled stone. Adjust the mortar bed to keep the surface flat, and check each piece for cracks before setting. Natural fissures are normal.

Mosaic Tile

- Use a small V-notch trowel (typically 1/16" to 3/16", smaller for thinner mosaics) so mortar does not squeeze up through the joints. Only spread as much mortar as you can cover in about 15 minutes.
- Press each sheet in with a grout float or flat beating block and tap the sides lightly to correct alignment. Keep the spacing between sheets the same as the joints within the sheet so sheet lines are not visible. On walls, a few finish nails in the top joint will stop sheets sliding while the mortar sets.
- Do not install mosaics directly over plywood or drywall. Use cement backer board or a suitable membrane.
- When cutting mosaics on a wet saw, place a flat tile or piece of hard plastic on the cutting tray so small pieces do not drop into the blade opening.
- Face-mounted (paper or film-faced) mosaics are set with the paper facing out. Dampen and remove the paper once the mortar has initially set, then clean the joints.

- Glass mosaics: use white mortar rated for glass tile and unsanded grout (epoxy only if the manufacturer approves it). Cut with a glass nipper or a wet saw blade made for glass.
- Stone, metal and mixed-material mosaics: seal stone pieces before grouting, use non-abrasive grout on polished or metal pieces, and follow any product-specific instructions.
- Mosaics containing metal are not recommended for showers, tub surrounds, pools, spas, steam rooms or any exterior application.

Wall Tile

- Floors and tubs are rarely level. Fasten a level ledger board one row up from the bottom, tile upward from the ledger, then remove it and cut in the bottom row.
- Use a non-sag mortar on walls to prevent tile from slipping. Check the weight limits of the wall board for heavy or large-format tile.
- Leave a gap where tile meets countertops, tubs and shower pans, and fill it with flexible sealant.
- Shower walls, niches and benches must be waterproofed, and horizontal surfaces sloped toward the drain.

Patio & Exterior Tile

- Use only tile rated for exterior use. In freeze-thaw climates the tile must be frost resistant, which typically means porcelain with water absorption of 0.5% or less. Most ceramic wall tile and many natural stones are not frost resistant.
- Choose a textured or slip-resistant finish for exterior walking surfaces. Polished tile is not recommended outdoors.
- The surface must slope away from buildings to drain water, a minimum of 1/8" per foot, with 1/4" per foot recommended. Standing water will lead to staining, efflorescence and freeze damage.
- Concrete slabs must be sound, cured and have control joints. Use an exterior-rated crack isolation or waterproofing membrane where required. Mortar coverage must be 95% or more with no voids where water can collect and freeze.
- Do not install when air or surface temperatures are below 50°F or when freezing is expected within 72 hours. Protect fresh installations from rain and direct sun while curing.
- Thick (2cm / 3/4") porcelain pavers may be dry-laid on compacted gravel or sand, or on pedestals, where the product is designed for it. Follow the paver-specific instructions.
- Tile over wood decks, balconies or roofs above living space requires an engineered, waterproofed assembly. Consult a qualified professional.

Radiant Heat

- Tile and stone are well suited to radiant heating. Install electric heating mats or hydronic systems following the heating system manufacturer's instructions, and test the system before, during and after installation.
- Do not turn on the heating system until the mortar and grout are fully cured (typically 28 days, or as directed by the setting material manufacturer). Raise the temperature gradually.
- An uncoupling membrane is recommended, and movement joints must be placed every 8–12 ft.

Post Installation Maintenance

- Keep traffic off the floor for 24–72 hours, or as directed by the setting material manufacturer.
- Use rosin paper or a breathable floor protection board to protect installed tile from other trades. Do not use plastic film or other non-breathing material over fresh grout.
- Buff off light grout haze with a clean, dry cloth once the grout has cured. For stubborn haze on ceramic or porcelain, use a grout haze remover compatible with your grout type (most grouts are polymer-modified). Never use acidic haze removers on natural stone.
- Keep a few spare tiles and the box labels (lot and shade numbers) for future repairs.
- Please refer to the Tile Outlets of America Tile & Stone Care & Maintenance Instructions for ongoing care.