

Section 8.3

CLEANING TILE AND TERRAZZO FLOORS

SCOPE

The final step in installing a tile or terrazzo floor is proper cleaning. Different materials require different cleaning methods to ensure that the finished surface reflects the inherent beauty and craftsmanship of the materials.

PRECAUTIONS

Before using any cleaning solution, test a small area of the floor to make sure that it is effective and not harmful to the surface. Whenever you are using cleaning compounds, follow the manufacturer's instructions for handling, application, cleanup and disposal. Where recommended, wear protective gear such as gloves and filter masks to avoid skin irritations or injury and to minimize breathing harmful fumes.

Generally, tile and terrazzo floors should not be cleaned with hydrochloric acid (also commonly referred to as muriatic acid), hydrofluoric acid, or acetic acid (vinegar) because they are harsh and can damage both the tile and the grout surfaces. When such aggressive cleaning is necessary, use sulfamic acid per the manufacturer's instructions with caution and only in the methods prescribed.

GLAZED TILE

After grouting the joints in a new tile floor, the grout residue must be removed from the surface of the tiles. The grout residue may harden very quickly while the grout in the joints will take considerably longer. Depending on the weather, the type of setting bed, adhesive and tile, the grout in the joints may set up in 5-20 minutes. If the grout on the tile surface has set up too much, the tiles will have to be scrubbed vigorously, which can damage the joints. The grout should be firm and resilient but not hard.



Using a damp sponge with rounded rather than square edges; test a small area by sponging the floor surface. If the sponge pulls grout out of the joints, the floor is not yet ready. Wait a few minutes and try again. Sponge the tile two or three times to remove the grout and neaten the joints. If you don't wait too long, you can remove any remaining grout haze from the tile surface by wiping with a cheesecloth or a soft, clean rag. If the haze has hardened too much, lightly scour the tile surfaces with a nylon scouring pad, allow the surface to dry again and then wipe with a cheesecloth. A white nylon-scouring pad will not scratch the tile surface.

Tiles with textured surfaces may require scrubbing with a nylon scouring pad to remove the grout from the low spots. Some tiles can endure scrubbing with a green pad, exercise caution not to dig-out the grout. Extra care and a little extra elbow grease will usually be necessary to clean a textured tile floor, but the surface may also camouflage latent grout deposits more than a flat, glossy tile on which the residue is obvious.

If the grout has set up too much before starting the cleaning process, you may have to begin with the nylon scouring pad to loosen the film. Then go over the surface a couple of times with a wrung out sponge. If this cleaning is not effective, allow the grout to harden for four or five days and scrub it with a wet nylon-scouring pad. If the haze still persists, a sulfamic acid solution can be used.

Since acid dissolves the cement in grout, acid cleaning should be done **ONLY AS A LAST RESORT, AND ONLY AFTER ALLOWING THE GROUT TO CURE FOR 28 DAYS**. Use in strict accordance with the manufacturer's directions.

Before cleaning with an acid solution, protect any metal or porcelain fixtures in the area with a protective coating of petroleum jelly. Flood the tile surface with water and allow it to soak in for a few minutes. This will reduce absorption of the acid into the tile and grout surfaces and minimize damage. Pour the sulfamic acid cleaner into a bucket of water, and work the solution into the floor surface with a nylon-scouring pad. Never use steel wool, wire brushes, metal buckets or other metallic tools with acid cleaners. Keep the floor surface wet during the cleaning procedure. Do not allow the surface to become dry or it will be damaged by the acid. After cleaning, flush the acid solution from the surface with an alkaline rinse to ensure that all acidic residue is neutralized. Rinsing with water will merely dilute the acid, but an alkaline solution (pH greater than 7) will chemically neutralize it. Make an alkaline solution by adding common household ammonia or a proprietary alkaline cleaner to the rinse water. (Never add ammonia to acid. It's dangerous.) Remove the protective petroleum jelly from metal and porcelain fixtures with hot, soapy water.

UNGLAZED TILE

Unglazed ceramic tiles have differing degrees of porosity and absorption depending on the density of the clay body and the degree of firing to which it has been subjected. Non-vitreous tile with absorption rates in excess of 7% will require application of a grout release agent to avoid grout staining and make cleaning easier. Some light colored tiles, even though they may have low absorption rates, can require application of a grout release agent if the grout to be used is a dark color. If you are not sure what the surface cleaning characteristics of a particular tile are, do a test panel before grouting to determine if a protective coating is needed.

After cleaning the floor surfaces as described above for glazed tile, remove the grout release agent in accordance with the manufacturer's instructions.

If the flooring is to receive a protective sealer finish to minimize staining, apply the sealer to the tile and grout joints after the cleaning operation is complete and the tile has been allowed to dry at the surface. Be sure that the sealer is a penetrating type recommended for floor tile applications. Film-forming sealers usually do not adhere well to the surface of unglazed tile. Follow the sealer manufacturer's recommendations for application. Wipe up all excess sealer immediately to prevent surface discoloration.

After the sealer has cured, some unglazed, natural clay tile floors are seasoned by mopping with a double strength application of a neutral liquid cleaner (pH 7) such as Murphy's® Oil Soap. Although such treatments may initially change the grout color, regular maintenance cleaning with a neutral cleaner will develop a natural patina that can be enhanced with soft buffing.

There are some special precautions which should be taken when using a pigmented grout with porcelain tile. The color pigment, once released from its cement matrix by an acid cleaning process, can settle into the finely textured surface of porcelain tile and be very difficult, if not impossible, to remove. This is especially true for red and black pigments which are ground to a very fine particle size. A tile sealer or grout release agent will not necessarily prevent this pigment staining, so it is a must that a test panel be prepared so that the safety and effectiveness of the cleaning can be investigated. If you do have problems with pigment deposition on the tile surface, some proprietary cleaning agents like Janitor-In-A-Drum® may be helpful, but there is no guarantee. A test panel is the safest way to avoid problems.

STONE AND TERRAZZO TILE

Marble, granite and slate are fabricated into natural stone tile, and stone chips are used to manufacture synthetic stone and precast terrazzo tile. Stone and terrazzo tile floors should be cleaned using the basic methods described above for glazed and unglazed ceramic tile. Some types of natural marble are very porous and may require the application of a grout release agent to facilitate cleaning. Granite and slate, which are denser and less absorptive, usually do not require grout release agents unless latex modified grouts are used. Acids should not be used on natural stone unless the quarry recommends it.

Latex modified grout can permanently discolor porous natural stone, and if it is allowed to dry on the surface, can damage a polished finish on any type of stone or terrazzo tile. Polished stone and terrazzo tiles and tiles of porous natural stone should be protected by a grout release agent.

LATEX MODIFIED GROUTS

Latex modified portland cement grouts are more difficult to clean from tile surfaces than non-modified grouts because of their increased bond and adhesion characteristics. A widely accepted cleaning procedure has been developed and is effective for most types of tile and a variety of proprietary latex additives. If a grout release agent has been used to minimize grout staining on the tiles, this method may not be effective, and a different cleaning procedure may be required.

When using a latex modified grout, the surface of the tiles should be wetted before grouting to minimize grout adhesion. After filling the joints, remove as much excess grout as possible with the grouting trowel, holding it at a 90 degree angle to the surface and going across the tiles diagonally from corner to corner. Clean the remaining grout from the surface using the following procedure. Fill two five-gallon buckets three fourths full of clean, cool water. Wet a terry cloth towel and wring out as much water as possible. Pull the flat, dampened towel diagonally across the surface of the tile from corner to corner. This will smooth the surface of the joints while removing the grout from the tile surface. Repeat this procedure two or three times, washing and wringing out the towel in clean cool water. Change the water in the buckets often. If the water is too dirty, it will leave a milky haze on the tile surface. When finished, the tile should be clean and the joint surfaces smooth and even. The next day, clean the haze off the tile surfaces with a nylon scouring pad. Wet the pad and lightly scour the surface. If any haze still remains, it may be necessary to rub the surface of the tile using sawdust dampened with a dilute solution of sulfamic acid and water. Unlike conventional cement grouts, it isn't necessary to wait for a full 28-day cure before using this cleaning method. Sulfamic acid is very mild, and by using the previously mentioned recommended method, the solution is not directly applied to either the tile or the grout surface. The sulfamic acid acts on the grout residue and the particles that are removed are held in suspension by the sawdust so that they are not re-deposited on the surface. Although sulfamic acid is very mild, it can damage some natural stone tiles and some glazed ceramics. Always test before using this procedure to avoid damaging the floor and verify with the manufacture the suitability of the material being cleaned.

Follow the manufacturer's directions for mixing the sulfamic acid solution and for safety precautions in handling and using the product. Dampen but do not wet the sawdust with the acid solution. Do not apply the acid solution directly to the floor. Dampen the floor with water before applying the sawdust to the surface. Pine sawdust is preferable. Do not use redwood or cedar shavings. Do not use hot water to mix with the sulfamic acid. After cleaning, flush the acid solution from the surface with an alkaline rinse to ensure that all acidic residue is neutralized. Rinsing with water will merely dilute the acid, but an alkaline solution (pH greater than 7) will chemically neutralize it. Make an alkaline solution by adding common household ammonia or a proprietary alkaline cleaner to the rinse water.

For tile that will not tolerate even this mild acid cleaning, use a non-acidic proprietary cleaner to dampen the sawdust. If the grout haze still remains after the sawdust cleaning, use a white scouring powder such as Ajax® or Bon Ami® with a nylon scouring pad to scrub the tile

surfaces. Rinse thoroughly afterwards and polish the tile surfaces with a cheesecloth if necessary. Some grout manufactures may have Latex removal solvents available for troublesome projects.

TERRAZZO

Harsh cleaners can damage terrazzo. The National Terrazzo and Mosaic Association (NTMA) recommends a neutral or slightly alkaline cleanser with a pH between 7 and 10 for both portland cement and epoxy terrazzo. Do not use all-purpose cleaners or soaps which contain water soluble, organic, or crystallizing salts, harmful alkalis or acids.

After grinding, grouting and finishing the surface, mix a neutral cleanser with water as directed by the manufacturer and allow it to remain on the floor for several minutes. Remove the cleaning solution by squeegee, wet vacuum, or by mopping with clean water. Be sure to keep the floor wet throughout the cleaning process so that dirt does not reabsorb into the floor. Always keep the rinse water, mops and buckets clean so that dirt is not re-deposited on the floor.

The portland cement matrix in portland cement terrazzo is absorbent and must be protected with a penetrating sealer. NTMA recommends acrylic water based sealers especially designed for terrazzo use. The sealer should have a slip resistance with a coefficient of friction rating of at least 0.5. Apply the sealer in accordance with the printed instructions.



PROTECTION

The general contractor must protect a new tile or terrazzo floor until the building is turned over to the owner. Portland cement terrazzo, portland cement setting beds, cement grouts and brick mortar will continue to cure and the mixing water will continue to evaporate for some time.

Protective coverings should not inhibit this curing and evaporation process. Heavy duty, non-staining craft paper will protect the floor against light traffic and provide sufficient permeability for the curing process to continue. Polyethylene sheeting, nylon tarps, or other non-breathable coverings will retard curing and may cause an uneven blotchy finish on portland cement terrazzo. If heavy traffic is unavoidable, wide flat plank walk and wheel paths should be provided. The general contractor should protect floors of portland cement terrazzo or portland cement grout for at least seven days, and floors of epoxy terrazzo or latex modified grout for at least three days.

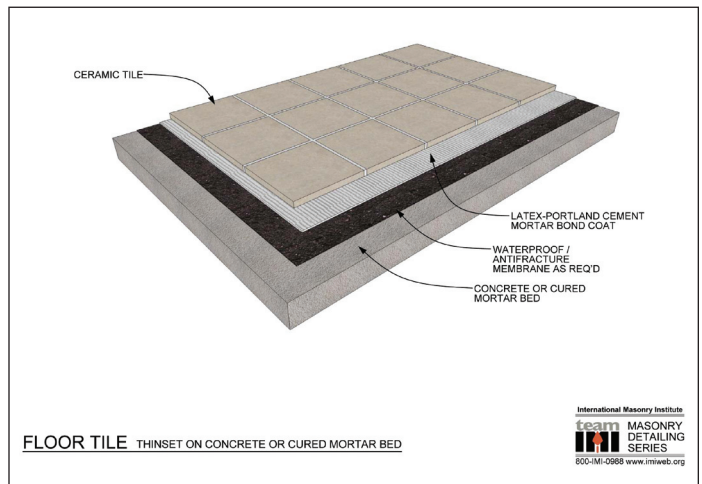
MAINTENANCE

Improper maintenance can ruin the appearance of tile and terrazzo floors and result in costly and time consuming callbacks to a job.

It is important to leave owners with information about the proper care and maintenance of their new floors. Supply them with the brand names of any sealers that have been applied during the finishing process, as well as the tile manufacturer's recommendations for daily and periodic cleaning. Include cleaning methods, cleaning solutions, stain removal methods, and any recommended waxes or polishes. If you are working under a general contractor, submit appropriate flooring maintenance information for inclusion in the general contractor's final project submittals.

MASONRY SUSTAINABLE DESIGN

While any floor requires periodic cleaning, tile and terrazzo systems do not require strong detergents that may be harmful to the installer and indoor environment. Instead, tile and terrazzo systems can be maintained with water, water and soap or a very mild cleaning solution and seldom require the need for powered cleaning equipment. LEED for Existing Buildings (EB): Operations & Maintenance specifically addresses cleaning products, material disposal, pollutant control and cleaning equipment under Indoor Environmental Quality category Credit 3, Green Cleaning. In addition to addressing the intents of LEED EB, Indoor Environmental Quality Credits, 3.1, 3.3, and 3.4, when used in walkways heading to the building entrances, tile and terrazzo serve to naturally prevent contamination of the building interior, thereby addressing the intent of LEED EB, IEQ Credit 3.5.



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