MAPEI®

TECHNICAL BULLETIN 010309-TB

What is that chalky white haze that sometimes appears on *Keracolor*™ *S* and *Keracolor U* grout?
Efflorescence is a crystallization of minerals that can occasionally form on the surface of Portland-cement grout joints. The term "efflorescence" is derived from the Latin word efflorescere, meaning "to blossom out," because the salt crystals are carried upward to the surface via evaporation. Efflorescence typically occurs when soluble salts from the Portland cement are carried by moisture to the top of the grout joint. As the moisture evaporates, it can leave behind salt deposits, which give the appearance of a chalky, white haze. The darker the color of the grout, the more noticeable the efflorescence will be.

The top 10 possible causes of grout efflorescence
1. **Too much water was used when grout was mixed.** A common mistake is to add water to the grout until a preferred consistency is obtained.
2. **Grouting was performed too soon after tile was installed.** When construction schedules run behind, installers are pushed to install grout as soon as tile is firmly set, even if the setting material is still wet or moist.
3. **Concrete slab was not fully cured or had a moisture vapor issue.** During fast-track construction projects, installers are rarely given the option to delay the installation until the slab is fully cured. This sometimes means that tile gets installed before slabs are ready to receive flooring. When wood-flooring installations fail as a result of concrete moisture issues, homeowners are typically convinced to make the switch to tile, having been advised that tile is better suited to handle concrete moisture issues; however, if the concrete slab has an existing moisture issue, a tile installation can also exhibit repercussions from this issue, including efflorescence.
4. **Water used in mixing or cleaning the grout was high in chlorine or had a high mineral content**. Well water, pond water, home water softeners and city water that is heavily chlorinated or has a high mineral content can contribute to efflorescence.
5. **Temperatures were too cold while grout was curing.** When the weather turns cold during exterior installations, the curing process is slowed and grout retains moisture for a longer period. New construction is typically at the mercy of the temperature outside and even existing structures are sometimes left unheated during remodeling periods.
6. **Sponge was too wet when used to clean the grout from the surface of the tile.** Many times, sponges are not wrung out properly after they are rinsed.

7. **Grout joints were wiped excessively during initial cleanup.** When tile has a rough glaze, porous surface or deep depressions in the surface, grout cleanup can become difficult. The tendency is to overwash the tile in an effort to remove as much grout residue as possible before it hardens.
8. **Standing water was left in empty grout joints prior to grouting.** A common industry recommendation is to moisten the tile surface with a wet sponge prior to grouting. Sometimes, an excessive amount of water is used during this process, and empty grout joints are filled up with water.
9. **Tile was especially dense and nonporous**. Unlike ceramic tile, which naturally absorbs moisture, porcelain tile will not absorb moisture from setting material or grout. This causes mortar and grout to retain moisture for a longer period of time, extending the curing times. This is especially true with installations of large-format porcelain tile.
10. **Grout was prematurely exposed to heavy amounts of water.** Because weather forecasts are not always perfect, unexpected rain can be a problem with exterior installations. During hot summer months, pools are often filled too soon after pool tile is repaired and grouted. And impatient homeowners often can't resist wet-mopping their new floor before grout has a chance to cure.

10 things you can do to help prevent grout efflorescence
1. Mix entire bags of grout at once. Avoid mixing small amounts or partial bags. Use an accurate measuring pitcher to ensure precise amount of water is used, as indicated on bag.
2. Under normal conditions, tile set with a traditional Portland cement-based thin-set or mastic requires about 24 hours of drying time before grouting, even if the tile is tightly bonded. Cooler temperatures will require longer drying times. Always follow the thin-set manufacturer's directions regarding the drying time required before grouting. In order to grout after only 3 to 4 hours, use MAPEI's *Ultraflex ™ RS*, *Ultracontact ™ RS* or *Granirapid ®* mortar.
3. Perform calcium chloride tests or relative-humidity moisture probe tests to ensure that concrete slabs are ready to receive tile installations. When needed, use moisture-reduction barriers such as MAPEI's *Planiseal ™ MRB* over concrete slabs.
4. Use bottled water for mixing and cleaning when water source has a high mineral content or is high in chlorine.
5. Cement grout cures properly at 73°F (23°C) with 50% relative humidity. Do not install grout at temperatures below 50°F (10°C). Plan exterior installations during warm-weather seasons when temperatures will remain above 50°F (10°C) until grout is fully cured.

6. Wring out sponges well before wiping grouted areas. A sponge that is too wet will cause the grout joints to become saturated during the initial cleanup. Be careful not to leave standing water behind.

7. When grouting heavily pitted tiles, use a grout bag and, as much as possible, avoid getting grout on the tile surface. When grouting unglazed, rough-finish or textured tiles, use a grout release agent or sealer to make cleanup easier and reduce the number of sponge passes needed.

8. When cleaning or moistening the tile surface before grouting, it is important to avoid drenching the joints and leaving water behind, which may not evaporate before grouting begins. Use damp sponges instead of wet mops to moisten or clean the tile surface before grouting. Ensure that all joint areas are free of water and are dry before grouting.

9. When installing large-format porcelain tile, allow extra drying time before grouting.

10. Avoid washing the floor or running the shower for at least 48 hours. Protect grout from rain for at least 72 hours. Do not submerge grout for 21 days. Use MAPEI's *Ultracolor* ® or *Ultracolor Plus* grout when a fast-track installation is needed.

How to clean/remove efflorescence from grout

- Moisten the grout with clean water and try scrubbing the efflorescence using a clean stiff nylon brush and/or a clean white nylon scrubpad.

- Avoid soaking the area with excessive amounts of water. In mild cases of efflorescence, this process will remove the powdery salt residue from the surface of the grout. In moderate cases of efflorescence, using a grout haze remover may aid in the removal of salt crystals. While grout haze removers are formulated to remove grout residue from the tile surface, they often work great for removing efflorescence as well. Follow the manufacturer's instructions for the grout haze remover. Scrub the efflorescence using a clean stiff nylon brush and/or a clean white nylon scrubpad.

- Severe cases of efflorescence may require the use of a phosphoric acid-based heavy-duty tile and grout cleaner. Follow the manufacturer's instructions for using a heavy-duty cleaner. Scrub grout using a clean stiff nylon brush and/or a clean white nylon scrubpad. Neutralize the area well by rinsing and scrubbing with cool, clean water. Grout should be allowed to harden at least 21 days before using any acid-based cleaner. Never use acid-based cleaners on natural stone.

Note: If planning to seal MAPEI's *Keracolor S* or *Keracolor U* grout, do not apply a sealer on the grout until all areas of efflorescence have been entirely removed and the grout is completely dry.

This bulletin replaces all previous MAPEI bulletins on the same topic.

For additional information, please contact our Technical Services Department.