Home Repair Resource center

HOMEOWNER REPAIR GUIDE

CERAMIC TILE FOR FLOORS & WALLS

PRODUCT CHOICES

Ceramic tile is a term that encompasses many diverse products, from wall tiles to floor tiles to tiles used on countertops. They come with a variety of finishes, from smooth to rough, and from flat to irregular. They are made from a number of different products, from clay to porcelain to ceramics to glass. They have either a sealed non-porous surface or a water-absorbing, porous surface. Whatever type you choose, all ceramic tiles are basically installed in the same manner.

In recent years, manufacturers have introduced new adhesives designed to work with the expanded array of tile now available to homeowners. As a rule, it doesn't pay to get a cheap adhesive; the more expensive products have technologically advanced formulas that give better adhesion, especially with porcelain tile. Talk with your tile supplier about which adhesive will work best with the tile you select.

PRODUCTS WORTH CONSIDERING

There are also new products you might consider for particular circumstances. **Red Gard™** is especially helpful in stall showers. When painted over the concrete beneath the tile, it creates a waterproof membrane that prevents mold and accepts up to 3/16" lateral movement, making it less likely that the tile above it will crack. (You can also use this product over cracks in concrete floors.) **Tec's 3N1™ thinset mortar**, in addition to giving excellent adhesion to the small porcelain tiles commonly used in older homes, will also accommodate some vertical movement in situations where that might be a problem. While neither product is inexpensive, using them when installing your tile might prevent pricey repairs in the future.

PREPARATION OF THE UNDERLAYMENT

The surface that floor tiles are attached to must be smooth and solid. Any movement of the wood underneath them will cause the tiles to crack. To provide the essential strength and rigidity, it is usually necessary to install **underlayment** first.

Tile is usually installed atop **backer board**, a concrete-type underlayment product that is impervious to water. It is particularly appropriate for use on bathroom floors, where water spills are common. You cut the sheets to size with a carbide scoring tool or a circular saw with a masonry blade, and then glue the pieces in place with construction adhesive or thinset mortar.

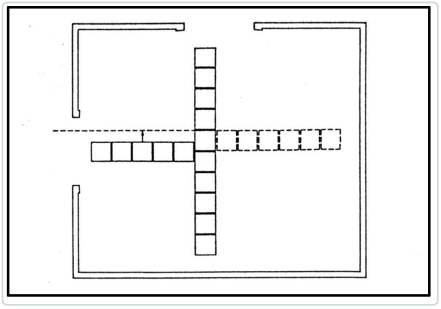
You can also use a layer of plywood at least 1/2" to 3/4" thick. For added stiffness, use two pieces of plywood, each half the total thickness of the underlayment you desire. Install them one at a time, at 90° angles to each other. Once the underlayment has been glued down with construction adhesive for added rigidity and then properly nailed in place, fill any cracks or gaps with floor leveler. *(See separate handout on "Floor Underlayment" for how-to instructions.)*

INSTALLING FLOOR TILE

In most rooms, floor tile should be laid from the center of the room outward. To locate the center, measure from the longest straight wall across to the other wall at either end, and find the midpoint of each line. Then, strike a chalk line joining these two midpoints. Repeat this process in the other direction. You should end up with two lines that cross each other in the center of your main floor area. That point is the center of your room.

Before installing your tile, however, you need to check your layout to make sure your tile is balanced around the walls. Starting at the center point, lay out one straight line of tiles in all four directions to the walls. Some tiles have small ridges on their edges that won't allow them to touch each other; these are designed to provide a uniform space into which you'll later install **grout** (the material that seals the gap between tiles.) If the tiles you have selected don't have these ridges, then you'll need to buy plastic **tile spacers** (small plastic "crosses" that you insert between adjacent tiles to maintain even spacing.) If you'll need to use spacers, put them in during this initial layout to get an accurate idea of how the tile will end up at the wall.

Ideally, the tile piece at each wall should be equal in size to the piece on the opposite wall. If your layout doesn't result in this even sizing, shift your center line one way or the other *(see illustration at right)* to balance the tiles. Do this until all your edges are as evenly spaced and balanced as possible.

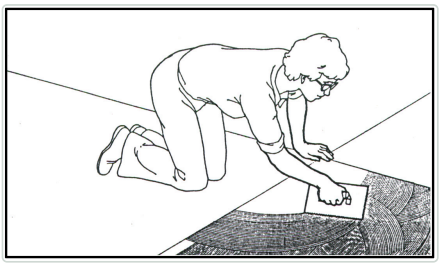


Shift the center line to balance the border tiles

Mark any adjustments you have made to your intersecting lines and the center point, and pick up the tiles and spacers. The next step is to mark some **chalk lines** as guides to keep the tiles straight as you install them. It's probably sufficient to mark every other row. (Remember to include the spacers when marking the widths of the tiles.) When finished, your floor will look like a giant checkerboard.

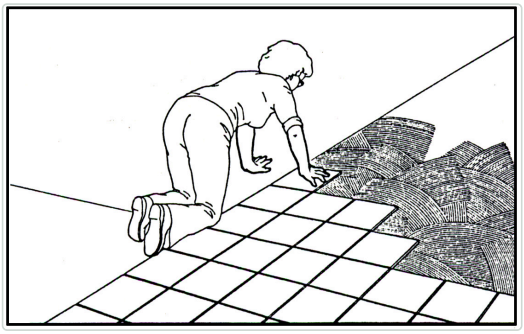
In a bathroom, however, it will be most visually pleasing if the tiles run parallel to the bathtub, even if the tub is not perfectly square to the walls. Adjust your chalk lines as described above to create equal cuts on opposite walls, and make sure your guide lines are at exact right angles.

Now you are ready to install your tile. If you will be imbedding your tile in adhesive or a "mud bed" of thinset mortar, the manufacturer's instructions will tell you what notch-size **trowel** you'll need. (The notches create grooves in the adhesive as you apply it, allowing room for it to spread as the tile is pushed into it and settles down flat.) Start in one quadrant of the floor, as determined by the center crossing lines, and spread the adhesive over about a three-foot square area at a time *(see illustration at right).*



Spread adhesive about three feet square at a time

Start laying the tiles *(see illustration below),* following your lines and using spacers (two on each side of the tile.) As you install subsequent tiles, be careful not to move the previous ones.



Lay tiles along your guide lines, one section at a time



Spacers keep grout width consistent

When you have this area installed, go back over the tiles with a **rubber hammer**, gently setting each tile firmly in the adhesive and driving out any air bubbles. (This will greatly reduce the chance that the tiles will crack later.) After using the hammer, move a 2' to 3'-long **wooden straight-edge** or **level** along the top of the tiles, to see if you have any tiles that are sitting higher than the others. Tap them down until the tiles are all uniformly level.

When you finish one section, move on to the next, until you have installed all the full-size tiles (called *"field tiles"*). Don't remove the spacers until the adhesive is set, at least overnight.

UNEVEN FLOORS: THE "LATH AND COAT" METHOD

If you have a particularly uneven substrate, you may want to install your tile using the "lath and coat" method, instead of the method described above. With this approach, you staple metal lath tightly to an underlayment of concrete backer board. (If you are using this method to cover a hardwood floor, use 1" or 1-1/4" staples, long enough to go through the flooring into the joists.) The lath is then covered with a layer of latex mortar mix, ½ to 1" thick, into which you imbed the tile.

CUTTING & SETTING BORDER TILES

When all the field tiles have been installed, it's time to cut the edge pieces (*"border tiles."*) You can use various cutting tools, depending on the type of cut needed. **Tile nippers** will allow you to break off small chunks to make minor adjustments to the

tile. You can also remove small areas of a tile using a **hack saw with a carbide blade**. In most cases, however, you'll be cutting one side of the tile along a straight line, to adjust the width to fit against the wall. For this job, you can use a **hand-powered cutter** that will let you score the tile along the cutting line and then apply pressure to break the tile along the line you have scored. (Special attachments to this tool can let you make holes in the tile for water pipes, etc.) If, however, you need to make an "L-shaped" cut, (changing directions, for example, to tile around a corner), then you'll be better off using a power saw. While you can equip a table saw with a tile cutting blade, most people find it easier to use a **"wet saw"** that sprays water over the tile as you cut to allow more accurate results. Rub a **smoothing stone** along the cut edges after using any of these tools.

After cutting the border tiles to fit, install them the same way you did the field tiles, using the spacers. After all the tile is installed and has had a day to set up, remove the spacers and clean off any adhesive on the tile surface.

GROUTING

Grout fills the gaps between the tiles. It comes in many colors to complement or contrast with your tile, depending on the "look" you desire. (Be aware that the darker the grout, the harder it will be to work with and the faster it will discolor.) Grout with sand is generally used on floors; smooth grout without sand on walls. If you mix the grout (which is in a powder form) with a **latex bonding additive** instead of water, it will provide a stronger, more waterproof seal between the tiles. Mix the grout to a plaster-like consistency (much like peanut butter), and spread it with a **rubber-bottom grout trowel**. By moving the trowel at a 45° angle across the surface, you can fill in the gaps between the tile. After the gaps are filled in and the grout has just begun to set up, take a wet **sponge** and lightly remove the residue from the surface, changing sponge water often. You'll need to repeat this procedure several times, to remove the excess grout; mop the floor the next day to remove any cloudiness that remains.

WALL INSTALLATION

You use much the same technique to install tile on a wall as you do on a floor. Locate and center the tile in the same way, and use the same method to install and grout it in place. Wall tile usually has more of a tendency to slip or slide down, so you'll need to pay particular attention to keeping the rows straight.

The best wall surface for tile is concrete backer board *(see "Preparation of the Underlayment," on page 1.)* Plaster and drywall are not good wall surfaces for attaching tile in a tub or shower surround or other areas frequently exposed to water.

On vertical surfaces, **ProLite® thinset mortar** will keep the tile aligned better than most glues. **OmniGrip® glue**, however, will also work well. The advantage to OmniGrip is that you can move the tile around for a while (in case you find your row is "drooping"); its disadvantage is that it takes several days to dry, so you can't grout the next day.

REPAIR AND MAINTENANCE

The two areas most likely to need attention later are cracked/broken tiles or damaged grout.

REPLACING A CRACKED OR BROKEN TILE

If you have a cracked or broken tile, you need to keep the neighboring tiles from being damaged as you remove the bad piece and install a replacement.

1. Start by carefully scraping out the grout surrounding the damaged tile using a **grout saw** or old screwdriver.
2. Then, wearing eye protection, chisel out the bad piece with a **cold chisel**, being careful not to break the surrounding tiles.
3. Use the cold chisel to clean as much adhesive as possible from the wall or floor area you exposed; then, apply glue or thinset mortar to the back of the replacement tile and set it in place.
4. With your rubber hammer and a block of wood, tap the replacement tile down to the level of the surrounding pieces and wipe off any adhesive that oozes out around it.
5. After the adhesive has set, you can grout around the new tile as described above.

RENEWING GROUT

Grout can be renewed by scraping out the bad areas, or even the entire area if you so choose. A **grout saw** works best for this job; it will remove the top 1/4-inch or so of grout. After scraping, you can re-grout the area as described above.

DON'T WAIT ON DAMAGED GROUT

It's important to replace grout as soon as it appears defective or has hairline cracks, to keep the wall or floor watertight. Once water is able to penetrate under the tile, it will destroy the floor or wall beneath it and cause the tile to literally fall off – requiring total replacement.

Home Repair Resource center

Home Repair Resource Center empowers homeowners to maintain their homes for sustainable and diverse communities.

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