



## HOW-TO BOOKLET #3045

# CERAMIC FLOOR TILE



### TOOL & MATERIAL CHECKLIST

- Adhesive Spreader
- Tile Cutter/Nippers
- Tile Adhesive
- Chalk & Chalkline
- Tile Sealer & Cleaner
- Putty Knife/Scraper
- Hammer
- Rubber Float/Squeegee Sponge and Wiping Cloths
- Tape Measure
- Tile Spacers/Molding
- Tile Grout/Bucket
- Ceramic Floor Tile/Spacers
- Carpenter's Square
- Straightedge/Level
- Pliers and Standard Screwdriver

**Read This Entire How-To Booklet for Specific Tools and Materials Not Noted in The Basics Listed Above.**

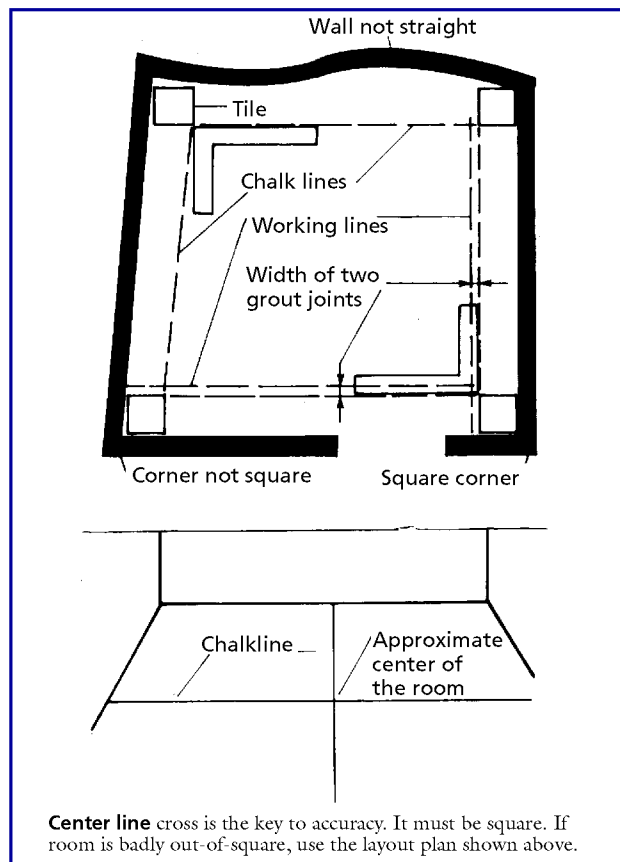
With ceramic floor tile, you get a surface that will last almost forever and designs that will go with any room furnishing and decoration. The surface is firm, wears like iron, and is easy to maintain. As a bonus, ceramic floor tile is easy for a do-it-yourselfer to install. No special skills are required, but patience is needed in layout, cutting and fitting.

### PROCEDURES TO FOLLOW

First, read this entire booklet. It can save you money and countless hours in figuring and fitting. Also, double-check the tool and material requirements on the front of the Booklet. You may already have some of this equipment—a savings.

**1** Figure the area of the floor which you will tile. Measure the length and width of the room and multiply these figures. **Example:** the length of the room is 12 feet and the width is 10 feet.  $12 \times 10 = 120$  square feet, which is the area. Now divide the number of square feet of tile in a tile carton into the area number. **Example:** The tile carton holds 8 square feet. 8 divided into 120 square feet, equals 15 cartons of tile needed. If possible, buy about 1/2 carton more tile than you need. You will break some tiles in laying them, and you may need replacement tiles in the future.

**2** Assemble all tools and materials you will need for the job so you don't have to stop work and run back-and-forth to the store for more supplies.



**3** Prepare the subfloor. It should be free of wax, grease, and any other debris. It also should be in good repair and fairly level.

Ceramic floor tile, although durable, is somewhat brittle and breakable if it's not supported by a sound and rigid subfloor. If the subfloor is uneven or "spongy," weight on the tiles can crack the tiles or jar them loose from the setting cement.

If your floor feels "flexible" when you walk over it, try adding rigidity by renailling the subfloor to the floor joists. Add bridging between the joists, and/or shim the subfloor with wooden shingle shims driven between the top edge of the joists and the bottom face of the subfloor.

If the floor is damaged and uneven, it is recommended that you put down an underlayment for the tile base. Underlayment should be a minimum of 1 1/8 inch in total thickness overall and the top sheet should be 1/2 inch-thick exterior grade plywood. Stagger the plywood so there are no common joints and nail it around the edges about 1/2 inch from the edge on 4 to 6-inch centers. Also nail it about 16 inches on center. Use ringed or cement-coated nails.

If the floor is concrete, it should be in good condition and free of all debris including grease, paint and wax. Repair any holes and cracks. You can sometimes lower "high" spots in concrete with coarse-grit abrasive on a belt or disc sander. Any minor humps and bumps from concrete splatter or debris can be removed with a cold chisel driven by a baby sledge hammer. **Be sure to wear gloves and safety glasses while doing this job.**

If the floor is covered with resilient tile or sheet vinyl flooring and this material is **FIRMLY** bonded to the floor, you can lay ceramic

tile over it. But clean the floor first: no wax, grease, dirt, dried paint, and so forth.

However, it is **STRONGLY** recommended that the original material be removed before installing new ceramic, since the ceramic tile installation will only be as good as the installation of the underlying floor. We also do not recommend that ceramic tile be set on parquet flooring. Remove the wooden tiles and clean the floor before laying the tiles.

**4** A clean floor is a **MUST**. Also remove the trim-quarter round and/or baseboard. Pry off the trim and pull out any nails from the back side of the trim and pull out any nails from the back side of the trim with pliers. This will prevent the trim from splitting so you can use it again. The trim will be installed over the tiles after the tiles are set and properly grouted.

Check the doors and door openings into the room. The thickness of the tile can block swinging doors, so doors should be trimmed slightly with a plane or saw so they will open and close properly over the new ceramic tile surface. See the illustration on page 4 on how to make this measurement.

### LAYOUT OF THE FLOOR AREA

Walls in relationship with floors in most houses are not square, although some may be close enough to square for tiling purposes.

If you determine that the room is square enough, snap a chalkline along the length of the area down the center of the room. Then snap another chalkline down the width of the room so each line crosses in the approximate center of the room. Check the cross with a carpenter's square to make sure it is **ABSOLUTELY** square at the center point.

Lay a row of tiles down both lines to the width and length of the room. Leave a little spacing for the grout lines and joints.

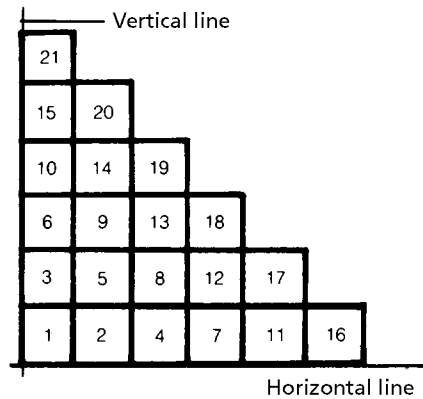
Carefully notice the tile spacing. If you see less than one tile width at the cross rows, move the center tiles either way to adjust this spacing. What you are doing is laying out the room so you can work with full or at least half-width tiles to avoid cutting and fitting. A slight adjustment at the center line may save you lots of time—plus the cost of extra tiling materials.

Once you establish this spacing, snap a chalkline at each end and at the sides of the area to be tiled. You now should have a square or rectangle that is square at the corners even though the floor area is not square. The border tiles will have to be cut to fit, but careful attention to tile spacing will reduce the amount of necessary cutting to a minimum.

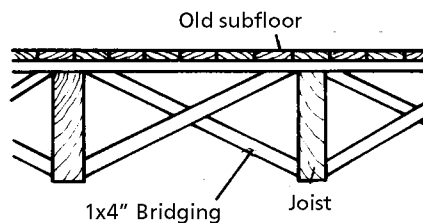
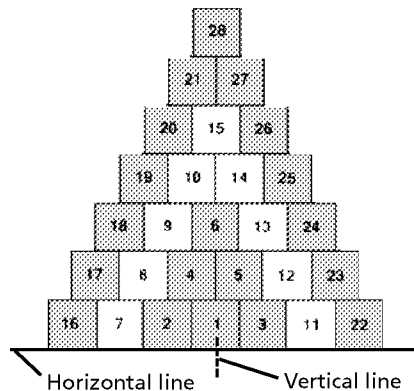
If the room is really out of square, you will have to establish square working lines within the room area. The illustration shows how.

The layout is similar to the one described above. However, you will have to work "within" an area in the room instead of from wall-to-wall. Be sure to allow for grout lines, since most floor tile doesn't come with built-in spacers (as wall tile does). If you will need a finishing tile that is cut to less than half its size, make an adjustment. If the grout line for the job is fairly wide, make the line smaller to add space next to the wall. If the grout line is fairly narrow, expand it to eliminate cutting tile. If neither of these options is viable, you will have to move the chalkline over on one side or the other. Check the layout again, using the tile lay-down technique described above. This takes time, but it is accurate.

Floor tiles are best centered in the room at a doorway for visual appearance. Or, you may center them with a prominent window in a room. If the door opening is a small one, centering is not too critical because you won't see the pattern. If the doorway is an archway, for example, center tile in the arch.



**Jack-on-jack pattern**, above is probably the easiest to set. The running bond pattern below takes more measuring, accuracy and patience.



If floor joists are “weak,” they must be bridged, as shown, to support the weight of the tile.

## LAYING THE TILE

There are two basic pattern options in floor tile: a jack-on-jack pattern, which is the most common, and a running bond pattern. Either is fairly easy to set, although the jack-on-jack pattern might be easier if this is the first time you’ve worked with ceramic floor tile.

Using your guidelines, **very carefully** set the first tile after the adhesive or dry-set cement has been applied to a small working area.

The first tile is the **key** tile to the entire project. Therefore, it must go down square to the guidelines. Any error you make here will compound itself as the tiles are laid. **Double-check for squareness and make any adjustments at this time.**

The tiles go straight down into the adhesive. Do not slide them in position. Just butt the edge of one tile against one that has been set and drop it into place. Then move it over a tad to form the grout line. Press the tile straight down at all four corners and in the center of the tile.

Some tile is pre-spaced. It has tiny lugs or bumps on the edges that automatically spaces the tiles for grout. However, most floor tile does not have this feature. You can buy spacers. If you can’t make your own. Use lattice molding cut into 2-inch lengths with a handsaw. As you set the tiles, put a spacer between them. When you complete an area, simply remove the spacers and use them over again.

Border tile is set last. If you have lots of tile to cut, it is recommended that you buy or rent a tile cutter. To buy, they are fairly reasonable in cost. After cutting, smooth tile edges on a brick or concrete surface by rubbing the rough edges along them.

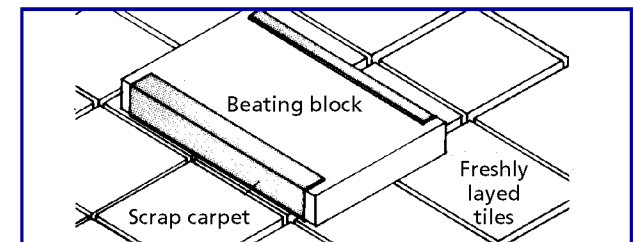
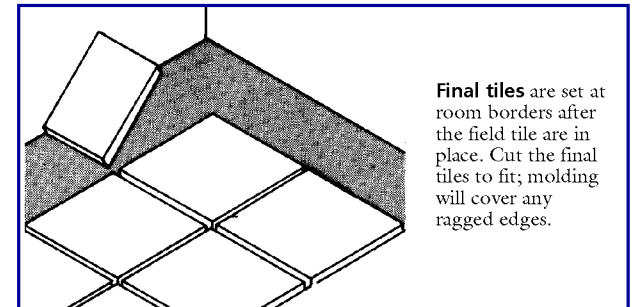
To go around obstructions such as vertical trim moldings (door casings), you can shape the tile with tile nippers. The nippers are like pliers. The secret is to take small nibbles with the nippers—not big bites. And work slowly.

When all tiles have been set in an area, clean off all mastic spills and other debris. Also check the joints between tile. If any adhesive or mortar has squeezed up into the joints, smooth it down with a nail point (16d common works good) or the rounded edge of an ice cream stick. Let the job set about 48 hours while the adhesive hardens.

## APPLYING THE GROUT

A rubber float is about the best way to apply the grout to the tile joints. The joints must be **FULL** of grout. Mix the grout to the consistency of thick paste. The float will push (or use a squeegee) the grout into the joints and off the surfaces of the tile faces.

Let the grout set 20 minutes or so. Then clean off any excess grout with a damp towel, rinsing the towel frequently. Keep the towel clean. Then go over the joints with the rounded end of an ice cream stick or an eraser on a lead pencil. This tool will smooth and help compact the grout even more.



**Bond** tiles better to the floor by tapping them lightly with a hammer and beating block. Pad the block to protect the faces of the tiles.

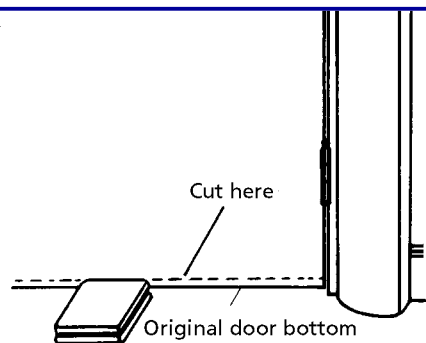
After you have smoothed the grout in the joints, go back over the tile once again with a damp, clean towel, removing as much of the grout film as possible. Even after you have wiped the tile several times, you will probably find that a haze still remains on the face of the tile. If that is the case, the one-time use of a tile cleaner will remove the haze. Simply follow the manufacturer's instructions.

Replace the trim. You may not be able to fasten trim such as quarterround or shoe to the floor or baseboard. If this is a problem, use a subfloor or construction adhesive to stick it in place. Or use a baseshoe that can be fastened to baseboard with 4d finishing nails. The molding will hide any imperfections along the border of the room.

Three weeks after the installation, seal the grout with a sealer made especially for ceramic tile. Follow the manufacturer's instructions.

## MOSAIC CERAMIC FLOOR TILE

These tiles are small and generally measure 1x1-inch square. They may be mounted on a 1x2- or 2x2-ft. paper or net material. The paper or net goes face down into the adhesive. The paper/net serves as a pre-spacer of the tiles and keeps the tile unit together until it is set.



**Door bottoms** may have to be trimmed slightly to clear the new floor tile. You can determine the cut by stacking two tiles next to the door bottom and scribing a line

Mosaic floor tile is estimated and layed-out the same way as regular tile, detailed above.

Because of the backing, the tiles are sort of “unfolded” down into the adhesive. Avoid any sliding of the material into the mastic. You should keep the grout spaces clean and free from as much mastic as possible.

Also work in a small area. Make sure the joints between tile squares match the spacing between individual tiles on the backing. Use spacers for this, or use thin molding as mentioned above. With a flat piece of wood or a small piece of plywood (2x2 ft. or so) firm the tile into the mastic by pressing down on the wood with your hands. Or use a rubber mallet. Do not stand on the wood. Too much pressure pushes adhesive up through the grout joints. It's a mess.

Set all field tile. Fill in the border tiles. You can score or break the paper or net backing with a sharp utility knife. Keep the knife blade clean. And don't forget the grout joint spacing between the field and border fill-in tiles.

Since the mosaic is small, it's best to use tile nippers – not a tile cutter – to fracture the tile to the size that you want. Just nibble along the edges until you get a proper fit. Smooth the edges by dragging them along a concrete block or brick. The grout will hide minor imperfections because it will spread over the imperfections at the joints.

Wait about 36 hours before grouting. Mix the grout to a paste consistency and spread it over the tiles and into the joints with a rubber float or squeegee. Do a small area. Then wipe the area with a damp sponge. Continue on until the joints are grouted and the tiles faces are fairly clean and free from grout.

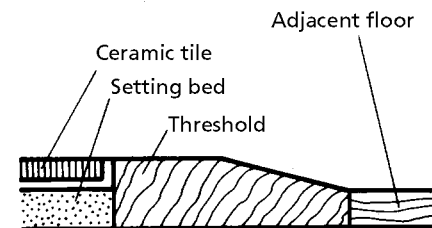
Go back to the spot you started. With an ice cream stick or eraser, smooth the grout lines. Don't press down hard. You want to “trowel” the joints lightly for a slight rounded effect. Do a small area, then wipe the tiles as clean as you can with a damp sponge. The sponge, in effect, will also help trowel the joints, so don't put too much pressure on the sponge as you wipe the tiles.

Again, go back to the spot where you started and very carefully inspect the grout lines. You may have to add a tad more grout to some areas. If so, wait again until these patches are dry and then go over the tiles once more with a damp sponge. Let the job set a week—or even more if you can. When you're satisfied with the job and the grout is hard, clean the tile with tile cleaner and seal it with a tile sealer. Follow the directions on the containers.

## CERAMIC TILE GROUT

Grout is available in powder form. You mix it with water or latex additive, which is the recommended method due to its greater stability. The grouts listed below may be used with ceramic mosaics, quarry, paver and packing house tile in dry and intermittently wet areas, areas subject to prolonged wetting, and exteriors: Portland cement; sand-Portland cement; dry-set; latex Portland; epoxy; silicone.

### Threshold, saddles



**Setting tiles** next to thresholds is handled this way. You may have to remove the old threshold and replace it in order to match the thickness of the tile and adhesive.