Ceramic Tile Underlayment

Because ceramic tile is rigid and somewhat brittle, a **strong underlayment** is the most important part of the tile installation. There are several options for achieving a sturdy floor underlayment.

To tile over an **existing floor**, it must be flat, solid, and well bonded to the sub-floor. The floor and subfloor should be at least 1 1/8" thick for good support.

If your existing flooring is cushioned vinyl or linoleum, you can either remove it or cover it with a proper underlayment. You can install tile over tile as long as it's level and in good condition. You may have to roughen the surface of tile if it's too glossy.

If you have more than one layer of flooring, or if it's damaged beyond repair, it must be removed and another underlayment installed.

WARNING: Some older resilient flooring may contain asbestos fibers. Do not try to remove or sand this type of flooring without having a trained asbestos inspector determine if asbestos is present. Resilient flooring with asbestos can be covered safely with plywood, or removed by a professional contractor.

Plywood Subfloor

Plywood may be used as an underlayment for tile floors if it meets certain standards.

Plywood must be installed over an adequate subfloor and be at least **1 1/8" thick** when combined with the subfloor.

Interior-grade plywood and particleboard are not considered a strong enough floor underlayment.

Fasten the plywood with drywall screws every six inches on the edges and eight inches in the field. You can also use ring-shank nails. The heads of the screws or nails should be driven in below the surface of the plywood.

Leave a gap along the wall at least 1/2" wide to allow for expansion and contraction. If you install it tightly against the wall, the floor could bellow up in places. Also leave a gap between sheets of plywood about 1/8" wide for this same reason.

Stagger the joints of the plywood from those of the subfloor. Also, line the sheets so the edges can be screwed into the joists, not just the subfloor alone.

TIP: Before installing the plywood, snap chalklines where the joists fall below the subfloor. This will make it

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easier to line up the plywood and screw directly into the joists.

After the plywood is installed, use a taping knife and your tile setting adhesive to cover the nailheads and fill the seams and cracks. After it dries, sand the adhesive smooth.

In high-moisture areas, such as a bathroom floor, it's a good idea to apply an **isolation membrane** over a wood underlayment. This is a thin rubber-like material that will protect the tile from the expansion and contraction of the wood subfloor caused by temperature and humidity changes.

Concrete Backerboard

For do-it-yourselfers, the best substitute for a mud bed underlayment is concrete backerboard.

Backerboard has a solid concrete core and is faced on both sides with fiberglass. It can't be damaged by water which makes it ideal for bathroom and kitchen installations.

Cutting backerboard is a lot like cutting drywall, except that backerboard is much harder.

Using a framing square, score your cut line a few times. You can use a regular utility knife for this, but you'll go through a lot of blades. A special carbide-blade cutter works better.

TIP: If you're using a utility knife, shorten the blade to keep it from breaking easily.

Break the board by applying pressure until it snaps apart along the score line. You'll probably have to cut through the fiberglass on the back also.

Backerboard is installed much like a plywood subfloor except that you also need to "set" it on to the subfloor using the same type of thinset adhesive (See) that you use to set tiles.

Use the flat side of a notched trowel to spread the thinset out where the sheet of backerboard will be set. Then use the notched side of the trowel to comb out the adhesive. Secure the sheets with galvanized nails about every 8 inches.

Stagger the joints of the backerboard so they don't line up with one another or fall directly over the joints of the subfloor.

Leave about 1/8" space between the sheets of backerboard.

Fill these gaps with tile adhesive using a taping knife. Embed **fiberglass joint tape** into the adhesive to cover the seams, then cover that with more adhesive. The idea here is to make the joint resemble the material as closely as possible.

Mortar Bed

Professional tile contractors often put down what they call a mortar, or **"mud" bed**. It consists of a layer of roofing felt, then a wire mesh, then mortar.

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A mortar bed is by far the best underlayment for floor tile, but it takes a lot of skill to finish it off level and at just the right thickness. This is the only type of underlayment not recommended for do-it-yourselfers.

If you're having a new floor poured, have it finished with a float that will leave a course surface. This is best for a tiling surface. If you already have a smooth-finished floor, rough it up before installing tile.

Check to be sure an existing concrete floor is flat. Move a straightedge over the surface and mark high and low spots. Low spots can be filled in with a leveling compound and high spots can be ground down with a rubbing stone or grinder.

TIP: Small cracks in concrete could be caused by the seasonal movement of the slab. To keep these movements from cracking your tile have an **isolation membrane** installed over the concrete. This is a thin rubber-like material that will protect the tile from the movements of the floor.

If you plan on having a tile floor in your shower, you will need to have a **shower pan** installed. A shower pan is a waterproof membrane designed to hold water, not just shed it.

This membrane is secured to the mortar bed of a shower with adhesive. It is creased at the corners and is run up the sides of the shower to form a pan. The center of the membrane is cut out for the drain. Another layer of mortar goes over the membrane and is sloped down to the drain.

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