

Overview - Building the base to a tiled shower.

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Most people don't realize it but glazed tiles are not completely waterproof although they are highly water resistant. The reality is that the tile and the grout are not the final line of defence against water leaking through to the ceiling below.

A proper built-in shower stall starts with a tapered mortar bed that defines the flow of water. This is run up to the lower portion of a double drain. Then a waterproof membrane is very carefully laid out over the shower floor and up the sides of the shower stall. The only holes allowed in this membrane are where the bolts from the drain go through the membrane, the drain hole itself, and some staples about a foot up the wall. The rest is perfectly water proof. Then the second layer of the floor drain is attached over the membrane. There are weep holes in this junction that will allow any seepage of water that hits the waterproof membrane to actually flow into the floor drain. Then another layer of mortar is layed over the membrane and up to the final drain height.

The first line of defense against water seepage is the tile, but the final line of defense against the soaking of the floor is that waterproof membrane.

Belyea Brothers of Toronto and Shower Door Canada built this beautiful walk-in shower.

I have received a lot of letters expressing confusion about the various steps to building a shower base, especially about the membranes, so I decided to detail the process for you, step by step. I hope this helps dispel the confusion.

1 - Install the rough in drain pipe. You need to know at this point exactly what drain you will be using to get the right rough-in size and have it at the right height. The best drains in the business come from Schluter, but all site-built ceramic floor shower drains must have a 'double' drain. The top part with a grill goes flush to the tiles on the top and is all you see when it is finished. Lower down, below the tiles but above the sloped mortar bed is a secondary drain that allows small quantities of water to seep through the tiles and get caught by a waterproof membrane and directed into the drain -- keeping the floor below dry. So you need to know exactly how you are going to build and finish the whole project before putting in the rough-in drain pipe, in fact buy all the pieces before starting so you can be sure of your measurements.

2 - Screw down a solid sub-floor.

3- On the plywood itself you could use a 'separator plastic' if you want to, or leave it off. The purpose of this plastic, if you use it, is to float the mortar bed so that it will not crack with movement of the floor below. It has nothing to do with keeping water from the shower out of the house framing, that is done by an obligatory waterproof membrane installed over the sloped mortar bed (see below).

Plastic on the floor or no plastic on the floor both work. Old Italians (the experts in tiles), always separate their base mortar from the floor so that it can 'float' and not crack from floor movement. However, in a small shower, the floor is not big enough to really pose a problem from expansion and contraction. You must put a waterproof membrane on the sloped mortar above so some installers argue that you are trapping the water in the mortar base between two membranes. To some extent that is true, but this water can very slowly evaporate out through the sides and should cause no problems. Plastic on the wooden floor? Yes and no - they both work, it is mostly a question of personal style.

4- Install the lower half of the shower floor drain. This will define the low spot for the sloped mortar.

5 - Pour the base mortar and create your slopes that must flow into the lower portion of the double drain. The mortar base should support the drain flange and be flush with it. Let the mortar set hard, you could let it dry if you wanted to. If you look at the Schluter system, they have an alternative of a polystyrene base that insulates the floor and creates the correct slopes -- totally eliminating that sloped base of mortar. This is a very nice and easy system, but more expensive than old fashioned mortar. You will need to use the mortar if you have an odd sized or odd shaped floor.

6- Now this is the critical part, where you must not get confused. Here is where a complete waterproof membrane is needed. This really should not be simply plastic but rather a waterproof material that will stick to thinset mortar or tile adhesive. Again, Schluter makes the best. This membrane is attached to the sloped mortar floor with thinset mortar, and goes over the drain, being glued down to the drain and then the drain hole cut out of the middle. It should also go a foot or so up the sides of the walls of the shower, some people put it all the way up behind the tiles, so that any water that may come through the tile grout above will be directed into the drain and not into the floor. No holes are allowed in this drainage membrane except the centre of the drain itself, two holes for the drain bolts and staples no less than a foot up the wall. If you are using a sloped polystyrene base, the membrane is glued down to the base as per manufacturers instructions. For a better look at the shower base with the Schluter system, check out Preventing Leakage Through A Shower Floor.

7- Now install the rest of the drain system -- locking the membrane into place and defining the top of the ceramic tiles.

8- Now you put down the thinset mortar or tile adhesive for the tiles themselves. These of course will be following the slope of the shower base. The tiles are set right up to the drain grill.

9- Then you grout the tile.

10- Then you seal the grout.

11- Then you put on the drain grill.

Understand that neither tile nor sealed grout stop 100% of the water, they are both porous. That is why we put a waterproof membrane under the tile on a slope that drains, rather than trying to catch the water in a trap over the floor below. If your only waterproof barrier is on the floor, it would eventually fill up with water, as there is no escape route. Without a waterproof membrane on the slope and without the double drain system, the floor will eventually rot out.

Using a base kit

The last two photos show a shower base kit from Schluter Systems that provides a solid pre-formed base together with the proper drain and membrane. That gives you a fully supported shower base without having to be a mortar artisan.

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