



Installation of Tile or Stone in Steam Rooms Over Backer Board

TDS 172

Steam rooms (of some manner) have been an essential component of gyms, athletic facilities, and clubs for years. In recent years, steam rooms and steam showers have become more and more common in-home environments. They are no longer just for health clubs or the very wealthy; now anybody can own their own steam room. Steam room and steam showers are often included in new home construction, rather than a standard shower. While there are many benefits to owning and using a steam room or steam shower there are also some basic principles that must be kept in mind when designing, installing and using these units:

1. Prevent steam from escaping
2. Collect any condensed water and allow it to drain properly
3. Keep water from dripping on the steam room occupants

Steam generation units create a great deal of moisture; this moisture initially takes the form of water vapor (steam). This water vapor is highly penetrative and any room not properly prepared may be exposed to damage caused by excessive moisture. Proper measures must be taken to prevent moisture transgression into or through walls, ceiling and floor.

These preventive measures include a properly placed, suitable vapor barrier and/or an acceptable waterproofing membrane. LATICRETE International, Inc. always recommends using both a vapor barrier, placed on the framing or on the concrete/concrete masonry units prior to further construction, and installation of HYDRO BAN® or 9235 Waterproofing Membrane. Alternatively, HYDRO BAN Sheet Membrane and HYDRO BAN XP are both a low perm products which act as both waterproofing and as a vapor barrier/vapor diffusion retarder and can be installed on top of the ceiling, floor and cement backer board or concrete walls. Tile is the perfect finish for a steam room application and choosing the right tile is important. For best results, the tile should be impervious (i.e. porcelain) or have a glazed surface to help limit the amount of moisture and moisture vapor that makes its way into the system.

The most frequently used method for installation of tile in a steam room incorporates steel or wood framing with a suitable backer board along with a concrete sub-floor. The ceiling must slope at least 2" minimum per foot (50mm per 300mm) to prevent water from dripping on steam room occupants (per Tile Council of North America recommendations). The floor should be pre-pitched (prior to the installation of the shower pan liner) at the rate of ¼" per foot (6mm per 300mm) to make sure that water flows toward the drain. Keep in mind that a shower pan is required in all steam room/steam shower installations! (See LATICRETE detail ES-SR614 available at <https://laticrete.com/en/solution-center/for-architects/architectural-guidebook-tool>).

For thin-bed ceramic tile installations when a cementitious bonding material will be used, including Large and heavy format tile mortar (medium bed mortar): maximum allowable variation in the tile substrate – for tiles with edges shorter than 15" (375mm), maximum allowable variation is ¼" in 10' (6mm in 3m) from the required plane, with no more than 1/16" variation in 12" (1.5mm variation in 300mm) when measured from the high points in the surface. For tiles with at least one edge 15" (375mm) in length, maximum allowable variation is 1/8" in 10' (3mm in 3m) from the required plane, with no more than 1/16" variation in 24" (1.5mm variation in 600mm) when measured from the high points in the surface. For modular substrate units, such as exterior glue plywood panels or adjacent concrete masonry units, adjacent edges cannot exceed 1/32" (0.8mm) difference in height. Should the architect/designer require a more stringent finish tolerance (e.g. 1/8" in 10' [3mm in 3m]), the subsurface specification must reflect that tolerance, or the tile specification must include a specific and separate requirement to bring the subsurface tolerance into compliance with the desired tolerance.

In addition to deflection considerations, above-ground installations are inherently more susceptible to vibration. Consult grout, mortar, and membrane manufacturer to determine appropriate installation materials for above-ground installations. A crack isolation and higher quality setting materials can increase the performance capabilities of above-ground applications. However, the upgraded materials cannot mitigate structural deficiencies including floors not meeting code requirements and/or over loading or other abuse of the installation in excess of design parameters.

The installation begins with the proper choice and placement of a two-part clamping ring style drain with weepers as per ANSI A112.21.1. Place tile spacers or gravel around weep holes, as detailed by the design professional, to prevent mortar from clogging the weep holes. The drain should be installed by a qualified plumber in accord with International Residential Code (IRC) P2709.4, International Plumbing Code (IPC) or local plumbing codes. The pipes and drain must be properly supported to prevent problems in the future. A suitable primary shower pan liner, complying with ASTM D4068 "Standard Specification for Chlorinated Polyethylene (CPE) Sheeting for Concealed Water-Containment Membrane", ASTM D4551 "Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Flexible Concealed Water-Containment Membrane" or other approved material (including HYDRO BAN®XP, HYDRO BAN, HYDRO BAN Sheet Membrane or 9235 Waterproofing Membrane), would then be installed to tie into the bottom flange of the drain (without blocking the weep holes). To fully evacuate water, shower pan membranes and bonded waterproof membranes must slope to and connect with a drain. Plumbing code typically requires shower pan membranes to be sloped a minimum of $\frac{1}{4}$ " per ft. (6mm per 300mm) and extend at least 3" (75mm) above the height of the curb or threshold, or, 6" (150mm) above the floor in steam rooms or steam showers without curbs. Account for the perimeter floor height required to form adequate slopes. Vapor barrier/vapor retarders must be placed so as to drain into the shower pan liner to ensure moisture escapes through weep holes in drain (see detail below). Membranes must be installed over the other horizontal surfaces in wet areas subject to deterioration, like steam room or steam shower seats. They must be sloped and configured so as to direct water to the membrane connected to the drain. The weep holes of clamping ring drains enable water to pass from the membrane into the plumbing system. Crushed stone or tile, or other positive weep protectors, placed around/over weep holes help prevent their blockage. To form a watertight seal, membranes must have adequate contact with the clamping ring of the drain or with the bonding area of an integrated bonding flange. The shower pan must be properly formed and fastened to prevent problems. Check with local building code to help determine what shower pan liner is acceptable in your area. Curbs must be sloped to the equivalent of $\frac{1}{4}$ " per foot (6mm per 300mm) drain back into the steam room for condensation runoff. Perform a flood test to determine integrity of the pan liner and make repairs as necessary before proceeding.

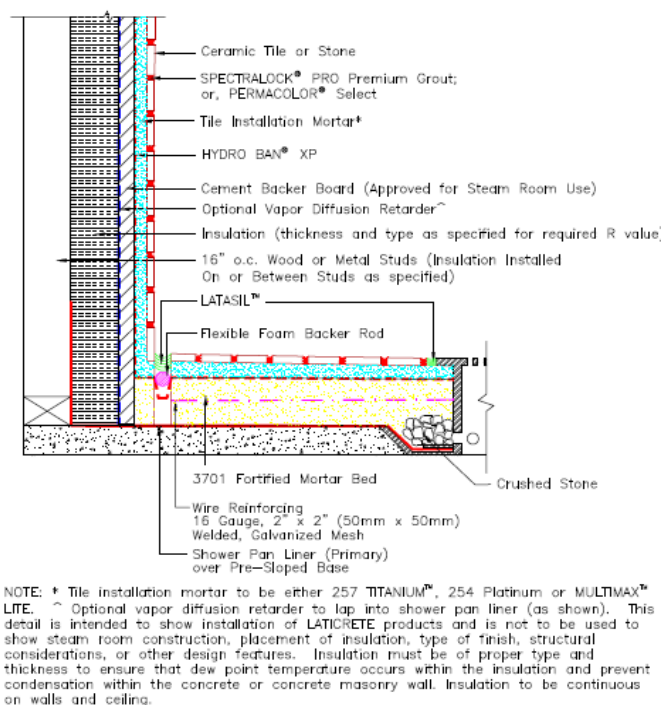
After the shower pan liner is in place, install the vapor barrier directly onto the side of the framing that will be exposed to the steam room. A vapor barrier should be rated for use in this application type (cross laminated virgin polyethylene is excellent) and, if possible, should be one piece that can fit into the entire area. Fasten the vapor barrier to the studs with corrosion resistant fasteners. A spot of LATASIL™ onto the fasteners will help prevent moisture penetration through the fastener holes. Make sure that the vapor barrier is properly formed and is tight to the studs of the walls and ceiling. Yes – the vapor barrier must be installed onto the ceiling as well as the walls because steam will certainly try to escape through the ceiling. It is imperative that this vapor barrier be placed so that it laps into the shower pan liner (see detail).

Next, install a 2" (50mm) thick (minimum) wire-reinforced, mortar bed comprised of 3701 Fortified Mortar Bed onto the shower floor. The wire-reinforcement should be 2" x 2" (50mm x 50mm), 16 gauge, galvanized, welded wire mesh (or ANSI A108.02 3.7) and should be placed at half the depth of the mortar bed. Make sure that the mortar bed maintains the $\frac{1}{4}$ " per foot (6mm per 300mm) slope to drain which was established by the pre-pitch in the sub-floor. Allow the mortar bed to cure for a minimum of 72 hours at 70°F (21°C) prior to installing HYDRO BAN XP, HYDRO BAN or 9235 Waterproofing Membrane.

The addition of a suitable insulation material between the studs, if specified, should be done before installation of the backer board. Insulation will help keep the heat in the steam room, keep the cool air out, and helps to control the dew point (the temperature where condensation takes place) within the wall. The backer board used

must be acceptable for steam room use and installed per board manufacturer's written installation instructions; this includes taping of all board joints if required by manufacturer. Use an ANSI A118.15 adhesive mortar (e.g. 254 Platinum 254 Platinum Plus or MULTIMAX™ LITE) and 2" (50mm) wide, alkali-resistant fiberglass mesh tape to treat the board joints. Be sure to allow space at the ceiling/wall transition for the insertion of a slip joint to allow for proper expansion/contraction to take place (as per TCNA method SR614).

Pipes and penetrations through board should be accounted for and space between board and penetration should be kept to a minimum. Allow the mortar used to tape the board joints to harden and then commence with waterproofing the entire inside area of the steam room with HYDRO BAN XP, HYDRO BAN, or 9235 Waterproofing Membrane. The entire steam room should be waterproofed, including the ceiling, walls, floor, seat, and any other exposed area; this will help improve the functionality of the vapor barrier and inhibit the passage of moisture through the system. When using the HYDRO BAN XP or HYDRO BAN ensure that any voids that exceed 1/8" are filled with mortar or treated with the 6" (150mm) wide reinforcing fabric. Loop the 9235 Waterproofing Membrane, HYDRO BAN XP or HYDRO BAN (with Waterproofing/Anti-Fracture Fabric) into the slip joints to allow for excessive movement in these areas. Make sure that ANY and ALL penetrations are properly waterproofed!



Tile can be installed directly onto the HYDRO BAN®XP, HYDRO BAN, HYDRO BAN Sheet Membrane or 9235 Waterproofing Membrane as soon as it is dry to the touch. 254 Platinum is the thin-set of choice for steam room/steam shower installations. Check with the manufacturer of the tile to make sure that it is compatible in steam room applications.

Once the tiles have set firm, grout the installation with SPECTRALOCK® PRO Premium Grout*, SPECTRALOCK PRO Premium Translucent Grout or SPECTRALOCK 1 Grout for best performance. Alternative grouting choices would be either PERMACOLOR® Select^; PERMACOLOR Grout; or, PERMACOLOR Select NS. Use LATASIL™, with LATASIL 9118 Primer, in slip joints, movement joints, around the drain, to seal lighting fixtures, access panels (if present), or at any change of plane. The use of SPECTRALOCK PRO Premium Grout, SPECTRALOCK PRO Premium Translucent Grout or SPECTRALOCK 1 Grout will add to the performance of the tile installation because it has an absorption rate of <0.5%. It will be necessary to wait for 14 days for the cementitious grout and SPECTRALOCK 1 Grout, and 10 days for SPECTRALOCK PRO Premium Grout or SPECTRALOCK PRO Premium Translucent Grout to cure at 70°F (21°C) before turning on the steam generation unit.

Please visit <https://laticrete.com/en/solution-center/for-architects/architectural-guidebook-tool> for several steam room methods, including full specifications, BIM models, submittal packages, and details.

* United States Patent No.: 6,881,768 (and Other Patents)

^ United States Patent No.: 6,784,229 (and Other Patents)

Technical Data Sheets are subject to change without notice. For latest revision, check our website at www.laticrete.com
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