



TECHNICAL BULLETIN #124

Regarding: Merkrete Sound Shield 7000, Sound Shield PNS 40 and Sound Shield PNS 90 membranes.

Overview:

Merkrete has had an excellent experience with the Sound Shield 7000, PNS 40 and PNS 90 membranes and sales have continued to grow. Unfortunately, there has been an increase of failures in the tile industry related to these types of membranes. The membranes are generally applied throughout the floor with full coverage. There are some issues regarding partial coverage installations. Membranes with soft or flexible fabric toppings have potential for the following issues:

- Peaking of the tile floor due to lack of movement (expansion) joints.
- Increased cure time of adhesive mortars.
- Shrinkage of cement and adhesive mortars.
- Cracking or delaminating of Self Leveling Underlayments.
- Cracking of narrow grout joints.

Movement Joints:

Movement (expansion) joints are critical when installing over the above membranes. Tile is allowed to expand and contract more when installed over the above membranes. Potential tile complaints when installed over the membrane are loose tile; tiles that have lifted or have suspect hollow sounds in the installation. Mortar beds installed over the membranes must be reinforced with wire mesh to control shrinkage of the mortar. Installation of TCNA recommended movement joints at the perimeter and in the field of the tile installation are required when installing over these membranes.

Increased Cure Mortars:

Membranes increase cure time for the majority of latex / polymer modified cement mortars by encapsulating moisture between the impervious tile and membrane. The encapsulated moisture could also affect dimensionally weak, moisture sensitive stone or cause increased moisture expansion in more absorptive clay body tile.

Tile installed over membrane is loose or cracked, and removal of tile reveals mortar remains soft and damp. Allow additional cure time before opening to traffic or use 801 Thin Set mortar which uses special cements that bind residual moisture.

Clay bodied tile or natural stone tile is loose, lifted and has hollow acoustic sound. Perform a 30 day mockup and test moisture sensitivity of natural stone or clay bodied tile prior to installation over membrane; avoid mortar thicknesses >3/8" (10mm) over membrane for dimensionally weak stone such as Limestone or Travertine.

Shrinkage of Cement Mortars

Do not use thinset mortar in thickness > 1/4 inch to install or level tile over membrane, as increased shrinkage of the thinset mortar may occur, which could exert stress on the membrane and result in loss of membrane adhesion. Medium bed mortars like 720 Marblemate are typically formulated to control shrinkage when used from 3/32" – 3/4" inch thickness, and are acceptable for use over membranes*. Thick mortar beds also require proper formulation and wire reinforcing to control shrinkage, and proper location of control joints.

Tile installed over membrane is lifted, or has suspect hollow acoustic sounds. Follow product data sheet and industry standard recommended guidelines for use of thinset medium bed or thick bed mortars; provide wire reinforcing and control joints in thick bed mortar installations to control shrinkage when installing tile over a membrane.

*Except for dimensionally weak stones, such as Limestone or Travertine's.

Self Leveling Underlayments

As a general rule, do not install thin, self-leveling underlayments over membranes; level the substrate before installation of the membrane. Underlay SLU self leveling products typically undergo initial expansion & contraction while curing, and could crack or delaminate when installed over a flexible surface with an absorptive fabric scrim. Do not install thin, self-leveling underlayments over membranes; level the substrate before installation of the membrane.

Narrow Grout Joints

Butted joints between large format tile >12" x 12" are not recommended when installing tile over membrane, especially with soft stone tile such as marble and limestone (MIA requires min 3/32 inch joints). The problem can be grout is cracked or pushed out of joints; joint may be narrower than original installation; tile edges, especially soft stone tile, may be chipped. Install minimum 3/32-1/8 joints when installing large tile (12" x 12" >); also follow above described guidelines to reduce potential for tile assembly movement.

Deterioration of Membrane Primer Adhesion

The Sound Shield PNS 40 and PNS 90 membranes require PrepSeal PNS Primer for all installations. When installing a membrane over concrete slabs, it is recommended, and required by Mer-Krete to test for pH and moisture vapor transmission through the concrete slab. Moisture that can accumulate beneath a membrane raises the alkalinity (pH) of the concrete and can deteriorate PrepSeal PNS Primer used to adhere membranes when pH > 9.5 (dry concrete pH 9.5, damp concrete pH 12). Always conduct moisture vapor transmission testing on concrete slabs prior to installation of membrane. Relative humidity should be <75% when tested according to ASTM F2170 or moisture vapor transmission should be below 3 lbs. when tested according to ASTM F1869.

Offset of Underlying Control Joints

Tile layout typically does not allow alignment with underlying control joints in concrete slabs. When using membrane to offset control joints in a concrete slab, it is important to observe requirements for placement of movement (expansion) joints in the tile, the extent of

membrane coverage required, and any requirements for cutting full coverage membrane installations to isolate stress on the membrane. The tile installed over membrane at or near control joints in the underlying concrete slab is loose, lifted, or has suspect hollow acoustic sounds. The reason is movement in underlying control joints is transferred to the membrane, and if tile is restrained, tile will lift upwards and cause loss of membrane adhesion. Provide adequate movement joints in the tile directly adjacent to locations where tile / membrane bridges underlying concrete control joints. This caution does not include installations where PNS 40 or PNS 90 are used in conjunction with Fracture Guard 5000.

When the above recommendations are followed, these membranes will perform. The tile installations will be durable and a good value for your customer.

The installation of ceramic tile must be done following installation standards published in the current (TCA) Tile Council of America handbook, ANSI (American National Standards) 108 specification and our data sheets.

Visit our website at www.merkrete.com or call the Technical Department at 1-(800) 226-2424 for additional information or to request Product Data sheets on Sound Shield 7000, PNS 40 and PNS 90 membranes.