



Thin-Set Troubleshooting Guide for Concrete and Masonry Substrates

TDS 209

Complaint	Cause(s)	Prevention
Cracked Tiles or Grout	1. Deflection of suspended slab 2. Hair-line or spider cracks in substrate 3. Lack of movement joints 4. Movement or settlement of substrate 5. Not enough thin-set on the back of the tile (tile not well bedded)	1. Substrate deflection rating of L/360 must be met to accept tile. Substrate deflection rating of L/480 must be met to accept stone. 2. Use HYDRO BAN®, HYDRO BAN® XP or 9235 Waterproofing Membrane to pre-treat any existing non-structural cracks in the substrate. 3. Follow Tile Council of North America (TCNA) Detail EJ171 for recommendation of placement of movement joints. 4. Ensure that construct meets industry guidelines. 5. Use recommended notch trowel for setting larger format tiles. Tiles larger than 8" x 8" (200mm x 200mm) require back-buttering for proper installation. Periodically check coverage and bond by picking up freshly installed tile and inspecting.
Loose Tile	1. Deflection of suspended slab 2. Hair-line or spider cracks in substrate 3. Lack of movement joints 4. Movement or settlement of substrate 5. Substrate surface not cleaned 6. Thin-set dried out before tile is laid 7. Not enough thin-set on the back of the tile 8. Kiln release or residue on back of tile 9. Tile subjected to stress prior to recommended cure time	1. Substrate deflection rating of L/360 must be met to accept tile. Substrate deflection rating of L/480 must be met to accept stone. 2. Use HYDRO BAN, HYDRO BAN XP or 9235 Waterproofing Membrane to pre-treat any existing non-structural cracks in the substrate. 3. Follow TCNA Detail EJ171 for recommendation of placement of movement joints. 4. Ensure that construct meets industry guidelines. 5. Surface must be free of contamination (e.g. sealers, curing compounds, coatings, oil, paint, dirt and dust). Clean contaminants from surface by sandblasting, shot-blasting, water blasting, bush hammer, machine grinding or other means of scarification. Chemical cleaning is not recommended. 6. Spread only enough thin-set mortar than can be covered within 15 to 20 minutes. Dampen substrate to allow for more open time with thin-set. 7. Use recommended notch trowel for setting larger format tiles. Tiles larger than 8" x 8" (200mm x 200mm) require back-buttering for proper installation. Periodically check coverage and bond by picking up freshly installed tile and inspecting. 8. Be sure to remove contaminants on the back of tile so as ensure proper adhesion of tile to thin-set. 9. Use correct thin-set mortar and additive for the substrate to be tiled. Allow for a sufficient amount of time for tiles to set firm prior to opening to traffic or use.

Hollow Sounding Tile	1. Deflection of suspended slab 2. Movement or settlement of substrate 3. Substrate surface not cleaned 4. Kiln release or residue on back of tile 5. Lack of movement joints 6. Not enough thin-set on the back of the tile	1. Substrate deflection rating of L/360 must be met to accept tile. Substrate deflection rating of L/480 must be met to accept stone. 2. Ensure that construct meets industry guidelines. 3. Surface must be free of contamination (e.g. sealers, curing compounds, coatings, oil, paint, dirt and dust). Clean contaminants from surface by sandblasting, shot-blasting, water blasting, bush hammer, machine grinding or other means of scarification. Chemical cleaning is not recommended. 4. Be sure to remove contaminants on the back of tile so as ensure proper adhesion of tile to thin-set. 5. Follow TCNA Detail EJ171 for recommendation of placement of movement joints. 6. Use recommended notch trowel for setting larger format tiles. Tiles larger than 8" x 8" (200mm x 200mm) require back-buttering for proper installation. Periodically check coverage and bond by picking up freshly installed tile and inspecting.
Tiles Tenting	1. Improper movement joint design	1. Follow TCNA Detail EJ171 for recommendation of placement of movement joints.
Staining of Light Colored Stones	1. Substrate surface not cleaned 2. High moisture vapor emission rate Negative Hydrostatic Pressure (moisture in slab) 3. Use of incorrect color adhesive	1. Surface must be free of contamination (e.g. sealers, curing compounds, coatings, oil, paint, dirt and dust). Clean contaminants from surface by sandblasting, shot-blasting, water blasting, bush hammer, machine grinding or other means of scarification. Chemical cleaning is not recommended. 2. Prior to installation have a calcium chloride test conducted to see how much vapor is being emitting from substrate. 3. Use white thin-set mortar for white or light colored stones

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