



# Thin-Set Troubleshooting Guide for Concrete and Masonry Substrates

## TDS 209

Complaint	Cause(s)	Prevention
<b>Cracked Tiles or Grout</b>	<ol style="list-style-type: none"> <li>1. Deflection of suspended slab</li> <li>2. Hair-line or spider cracks in substrate</li> <li>3. Lack of movement joints</li> <li>4. Movement or settlement of substrate</li> <li>5. Not enough thin-set on the back of the tile (tile not well bedded)</li> </ol>	<ol style="list-style-type: none"> <li>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.</li> <li>2. Use HYDRO BAN® or 9235 Waterproofing Membrane to pre-treat any existing non-structural cracks in the substrate.</li> <li>3. Follow Tile Council of North America (TCNA) Detail EJ171 for recommendation of placement of movement joints.</li> <li>4. Ensure that construct meets industry guidelines.</li> <li>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.</li> </ol>
<b>Loose Tile</b>	<ol style="list-style-type: none"> <li>1. Deflection of suspended slab</li> <li>2. Hair-line or spider cracks in substrate</li> <li>3. Lack of movement joints</li> <li>4. Movement or settlement of substrate</li> <li>5. Substrate surface not cleaned</li> <li>6. Thin-set dried out before tile is laid</li> <li>7. Not enough thin-set on the back of the tile</li> <li>8. Kiln release or residue on back of tile</li> <li>9. Tile subjected to stress prior to recommended cure time</li> </ol>	<ol style="list-style-type: none"> <li>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.</li> <li>2. Use HYDRO BAN or 9235 Waterproofing Membrane to pre-treat any existing non-structural cracks in the substrate.</li> <li>3. Follow TCNA Detail EJ171 for recommendation of placement of movement joints.</li> <li>4. Ensure that construct meets industry guidelines.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>8. Be sure to remove contaminants on the back of tile so as ensure proper adhesion of tile to thin-set.</li> <li>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.</li> </ol>
<b>Hollow Sounding Tile</b>	<ol style="list-style-type: none"> <li>1. Deflection of suspended slab</li> <li>2. Movement or settlement of substrate</li> <li>3. Substrate surface not cleaned</li> <li>4. Kiln release or residue on back of tile</li> </ol>	<ol style="list-style-type: none"> <li>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.</li> <li>2. Ensure that construct meets industry guidelines.</li> <li>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</li> </ol>

	<ol style="list-style-type: none"> <li>5. Lack of movement joints</li> <li>6. Not enough thin-set on the back of the tile</li> </ol>	<p>means of scarification. Chemical cleaning is not recommended.</p> <ol style="list-style-type: none"> <li>4. Be sure to remove contaminants on the back of tile so as ensure proper adhesion of tile to thin-set.</li> <li>5. Follow TCNA Detail EJ171 for recommendation of placement of movement joints.</li> <li>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.</li> </ol>
<b>Tiles Tenting</b>	<ol style="list-style-type: none"> <li>1. Improper movement joint design</li> </ol>	<ol style="list-style-type: none"> <li>1. Follow TCNA Detail EJ171 for recommendation of placement of movement joints.</li> </ol>
<b>Staining of Light Colored Stones</b>	<ol style="list-style-type: none"> <li>1. Substrate surface not cleaned</li> <li>2. High moisture vapor emission rate Negative Hydrostatic Pressure (moisture in slab)</li> <li>3. Use of incorrect color adhesive</li> </ol>	<ol style="list-style-type: none"> <li>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.</li> <li>2. Prior to installation have a calcium chloride test conducted to see how much vapor is being emitting from substrate.</li> <li>3. Use white thin-set mortar for white or light colored stones</li> </ol>

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