

Thin-Set Troubleshooting Guide for Concrete and Masonry Substrates

Complaint	Cause(s)	Prevention
<p>Cracked Tiles or Grout</p>	<ol style="list-style-type: none"> 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) 	<ol style="list-style-type: none"> 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 LATICRETE® 9235 Anti-Fracture Membrane alongwith LAticrete 3642 and 226 thick bed mortar to pre-treat any existing non-structural cracks in substrate. 3. Follow Tile Council of North America (TCNA) Detail EJ-171 for recommendation of placement of movement joints. 4. Ensure that constructor meets industry guidelines. 5. Use recommended notch trowel for setting larger format tiles. Tiles larger than 8" x 8" (200mm x 200mm) require backbuttering for proper installation. Periodically check coverage and bond by picking up freshly installed tile and inspecting.
<p>Loose Tile</p>	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 LATICRETE® 9235 Anti-Fracture Membrane alongwith LAticrete 3642 and 226 thick bed mortar to pre-treat any existing non-structural cracks in substrate. 3. Follow TCNA Detail EJ-171 for recommendation of placement of movement joints. 4. Ensure that constructor

	<p>prior to recommended cure time</p>	<p>meets industry guidelines.</p> <p>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.</p> <p>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.</p> <p>7. Use recommended notch trowel for setting larger format tiles.</p> <p>Tiles larger than 8" x 8" (200mm x 200mm) require backbuttering for proper installation. Periodically check coverage and bond by picking up freshly installed tile and inspecting.</p> <p>8. Be sure to remove contaminants on the back of tile so as ensure proper adhesion of tile to thin-set.</p> <p>9. Use correct thin-set mortar and additive for the substrate to be tiled. Allow sufficient time for tiles to set firm prior to opening to traffic or use.</p>
<p>Hollow Sounding Tile</p>	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 constructor meets industry guidelines. 3. Surface must be free of contamination (e.g. sealers, curing compounds, coatings, oil, paint, dirt and dust). Clean back of the tile contaminants from surface by sandblasting,

		<p>shot-blasting, water blasting, bush hammer, machine grinding or other means of scarification. Chemical cleaning is not recommended.</p> <p>4. Be sure to remove contaminants on the back of tile so as ensure proper adhesion of tile to thin-set.</p> <p>5. Follow TCNA Detail EJ-171 for recommendation of placement of movement joints.</p> <p>6. Use recommended notch trowel for setting larger format tiles.</p> <p>Tiles larger than 8" x 8" (200mm x 200mm) require backbuttering for proper installation. Periodically check coverage and bond by picking up freshly installed tile and inspecting.</p>
Tiles Tenting	1. Improper movement joint design	1. Follow TCNA Detail EJ-171 for recommendation of placement of movement joints.
Staining of Light Colored Stones	<p>1. Substrate surface not cleaned</p> <p>2. High moisture vapor emission rate Negative Hydrostatic Pressure (moisture in slab)</p> <p>3. Use of incorrect color adhesive</p>	<p>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.</p> <p>2. Prior to installation have a calcium chloride test conducted to see how much vapor is being emitting from substrate.</p> <p>3. Use white thin-set mortar for white or light colored stones</p>

Cement Grout Troubleshooting Guide

Complaint	Cause(s)	Prevention	Potential Solutions
<p>Weak, powdery grout joint</p>	<p>1. Too much water (liquid) used in mix. 2. Grout dried out too fast due to: a. highly absorbent tiles b. high temperature (>85°F), low humidity (<50%RH).</p>	<p>1. Mix must be firm not soupy. Do not re-temper grout after initial mixing. 2a. Pre-wet tiles to reduce absorption. 2b. Use latex additive or damp cure for 72 hours with Kraft paper per Tile Council of North America guidelines.</p>	<p>Attempt to re-hydrate the grout by damp curing the grout for 72 hours. The use of a grout sealer may also help to harden the grout.</p>
<p>White powder on surface</p>	<p>1. Efflorescence due to: a. Damp slab or grouting too soon after setting b. Too much water used in mix c. Too much water used during clean up d. Hard water or water softened with salt 2. Cement laitance due to: a. Too much water used in mix b. Too much water used during clean up</p>	<p>1a. Slab on grade must be > 7 days old. Slab on grade should be tested for moisture using polyethylene. If moisture detected, a vapor barrier must be used under mortar bed. Under damp, cool conditions never grout within 24 hours of setting. Thick beds and narrow joints require longer drying time to avoid efflorescence. 1b. Mix must be firm not soupy. 1c. The single most common cause of grout shade/color problems. 1d. If water quality is suspect, conduct A test area. Use only potable (drinking) water or latex additive for mixing</p>	<p>Use a stiff bristle brush or scrub pad and a light solution of phosphoric acid or sulfamic acid crystals to clean the deposits. Several cleanings may be required until the salts work their way through the installation system. Conduct a test area to verify results.</p>

		<p>grout.</p> <p>2. Both causes result in a porous matrix where fine particles of sand and cement float to surface, leaving whitish deposit.</p>	
<p>Color shading Over surface</p>	<p>1. Too much water used during clean up</p> <p>2. Too much water used in mix</p> <p>3. Cleaning too soon after installation with excess water</p> <p>4. Uneven grout depth</p> <p>5. Uneven absorption of tiles with partially glazed edges</p> <p>6. Non-uniform drying conditions</p> <p>7. Use of different production batches of grout</p> <p>8. Inconsistent liquid to powder ratio used with multiple batches.</p> <p>9. Poor quality water: discolored, hard, softened with salt, etc.</p>	<p>1. Use minimum amount of water to reduce pigment loss during clean up.</p> <p>2. Mix must be firm not soupy, reducing any pigment float.</p> <p>3. Allow grout to take initial set to lock in pigment.</p> <p>4. Rake excess adhesive mortar out of joints to achieve uniform depth.</p> <p>5. Pre-wet highly absorbent tiles by sponging surface.</p> <p>6. Shade areas exposed to sunlight, avoid direct ventilation drafts.</p> <p>7. Check batch # to insure all grout from same batch # or pre-blend bags of grout.</p> <p>8. Use the same amount of liquid and powder for multiple batches. Use measuring equipment if necessary.</p> <p>9. Use only potable (drinking) water or latex additive for mixing grout.</p>	<p>Try one of the following:</p> <p>Using a grout sealer may even out the color.</p> <p>“wet look” or “enhancer” type sealers can deepen and even out the final grout color. Use an epoxy based grout colorant to stain / seal the grout joints. These products can be custom matched to all of the LATICRETE Grout Colors. Conduct a test area to verify results.</p>
<p>Cracking of grout joints</p>	<p>1. Excess water in mix</p> <p>2. Flexural movement of substrate (wood)</p> <p>3. Building movement</p>	<p>1. Reduce amount of water in mix and clean up procedure, 2 & 3. Insure substrate is in</p>	<p>If cracking is due to shrinkage of the grout, at times the use of a grout colorant can be used to</p>

		compliance with local codes, Tile Council of North America and other industry guidelines	“fill” in the small hairline fissures. If the cracking is due to movement in the structure, a review of the structure should be conducted to ensure that it complies with industry standards. If the structure does not meet industry standards, the required “stiffening” of the structure should be made prior to making grout joint repairs. When re grouting, remove at least half the depth of the existing grout joint down to firm and stable grout, then clean thoroughly prior to regrouting.
Joint color is lighter Than sample	1. Grout dries too fast. Not properly cured.	1. When temperatures exceed 90°F use latex admixture or damp cure for 72 hours with Kraft paper per Tile Council of North America guidelines.	Using a “wet” look or “enhancer” type sealer will deepen the grout colourant