



TECHNICAL BULLETIN – TB253

ADHESIVE CONSIDERATIONS FOR UNSTABLE STONE AND COMPOSITE TILES

SEPTEMBER 2024

INTRODUCTION & SCOPE

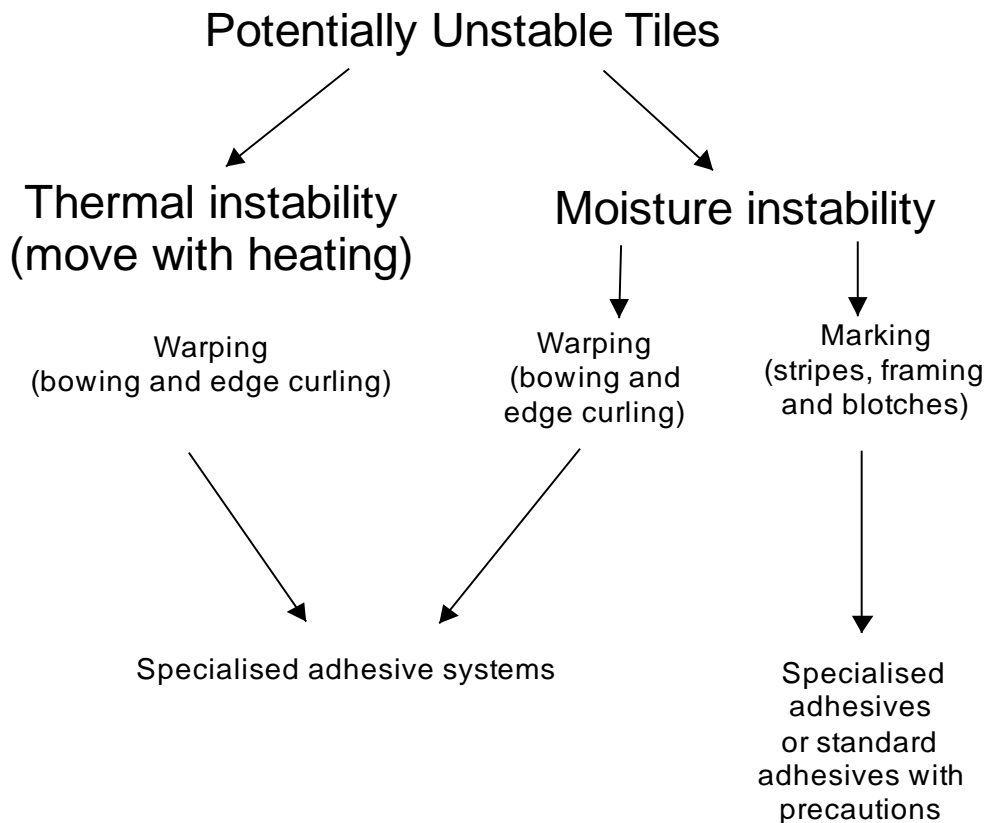
As described in Technical Bulletin TB010, a range of underlying issues must be considered when selecting adhesives for bonding sensitive tiles. This bulletin discusses these issues.

DEFINITIONS

Stable -- tiles unaffected by water and/or thermal heating and cooling.

Unstable – tiles are affected by water and/or thermal heating and cooling.

This flow chart offers considerations regarding stability issues.



TYPES OF TILES AFFECTED



The following types of tiles can be dimensionally unstable.

Thermally unstable	Moisture unstable
Some stone tiles (usually dark colours)	Various stone tiles
Polymer matrix* terrazzo	Some cement matrix tiles/terrazzo
Some cement matrix tiles/terrazzo	

The problem can be compounded when the tiles display multiple instability modes. Combination modes tend to be thermal and moisture warping while marking is a single mode. These issues occur due to the tiles' porosity or variable porosity. The colour of the tiles can also affect stability.

Moisture stability problems can arise from exposure to rain, constant washing, or even rising dampness. Moisture in a tile adhesive can also affect extremely moisture-sensitive tiles.

Thermal problems occur when exposed to solar radiation externally or through skylights and large windows. Fireplaces can also be a source of heating. Thermal effects can occur during adhesive cure and normal service.

Note: * Tiles with polyester resin backing can display chemical instability when exposed to standard cement-based adhesives.

DECIDING ON A FIXING SYSTEM

The first consideration for any potentially unstable tile is whether it has been tested or examined for stability. If that is the case, a tile adhesive choice can be made. If this is not the case, tests or trials may be necessary to determine stability. The choices of adhesives are divided into three types,

- Standard C Class adhesives (typical cement-based systems)
- Specialised C Class adhesives with F rating (rapid cure cement-based adhesives)
- High-performance R Class adhesives (structural epoxies – a premium method).

The degree of instability can be measured. Technical Bulletin TB010 describes three general distinctions (based on measurement) for ARDEX.

- Low instability
- Moderate instability
- High instability (further divided into various degrees, including extreme, which have no recommendations)

Thermally unstable tiles	Moisture unstable - warping	Moisture unstable - marking
---------------------------------	------------------------------------	------------------------------------



<p>High Movement Tiles (>0.4mm) R Class epoxies for any tile type except extreme <i>ARDEX WA100</i></p>	<p>High Movement Tiles (>0.4mm) R Class epoxies for any tile type except extreme <i>ARDEX WA100</i></p>	<p>High marking potential R Class epoxies for any tile type except extreme <i>ARDEX WA100</i></p>
<p>Moderate Movement Tiles (0.25-0.4mm) C2 S1-2 F and C1 S1 F rated C Class adhesives <i>ARDEX Quickbond ± Abalastic</i> <i>ARDEX S28N ± ARDEX E90</i></p>	<p>Moderate Movement Tiles (0.25-0.4mm) C2 S1-2 F and C1 S1 F rated C Class adhesives <i>ARDEX Quickbond ± Abalastic</i> <i>ARDEX S28N ± ARDEX E90</i></p>	<p>Moderate marking potential F rated C Class adhesives for tiles that are slightly to moderately sensitive <i>ARDEX Quickbond ± Abalastic</i> <i>ARDEX S28N ± ARDEX E90</i></p>
<p>Low Movement Tiles (<0.25mm) C Class adhesives S1 or S2 rating increases resilience (See adhesive list below)</p>	<p>Low Movement Tiles (<0.25mm) C Class adhesives S1 or S2 rating increases resilience (See adhesive list below)</p>	<p>Standard C Class adhesives up to moderate marking potential <i>The following rules apply</i></p> <ul style="list-style-type: none"> ➤ Full coverage (100%) is achieved by notching adhesive and back buttering ➤ Initial colour/shade shifts are accepted ➤ Subsequently, developed colour/shade shifts are accepted ➤ Colour/shade shifts can be permanent ➤ High-marking potential tiles need to be very carefully considered <p>(See adhesive list below)</p>

Standard C Class adhesives are used with stone and terrazzo type tiles for *low movement* or used when *considering the provisos in blue for moisture marking tiles*

- ARDEX X18 ± ARDEX E90 (internal/external)
- ARDEX X68 ± ARDEX E90 (internal/external)
- ARDEX X77 ± ARDEX E90 (internal/external)
- ARDEX X78 ± ARDEX E90 (internal/external)
- ARDEX X7 + ARDEX E90 (internal / external)
- ARDEX X10 (internal/external)
- ARDEX X17 (internal/external)
- ARDEX X52 (internal/covered external)



- ARDEX X56 (internal/covered external)
- ABA Fibrestik (internal/external)
- ABA Powerstik (internal/external)
- ABA Powerstik Plus (internal/external)
- ABA Choicestik ± ARDEX E90 (internal/external)
- ABA Glue Plus (internal / covered external)
- ABA MPP (internal)

All adhesives should be used per the recommendations in the Product Datasheet. Note that recommendations concerning moisture-sensitive tiles with moisture marking potential supersede those on the packaging and datasheets.

GROUTING OF MOISTURE-SENSITIVE STONE AND TILES

ARDEX does not have grout for moisture-sensitive natural stones. The following ARDEX grouts can be used, but testing in inconspicuous areas is advised. Each grout has the potential to stain or cause instability in medium-to-high moisture-sensitive tiles.

Marking effects may not be seen as a defect if barely noticeable.

- ARDEX FG-8
- ARDEX FS-DD
- ARDEX WJ-50
- ARDEX EG-15

Further Reference

ARDEX Technical Bulletin TB010 Fixing Moisture Sensitive Tiles

ARDEX Technical Bulletin TB238 Resin Matrix Shower Bases

ARDEX Technical Paper TP005 Natural Stone Tile Stability

IMPORTANT

This Technical Bulletin provides guideline information only and is not intended to be interpreted as a general specification for the application/installation of the products described. Since each project potentially differs in exposure/condition, specific recommendations may vary from the information contained herein. For recommendations for specific applications/installations, contact your nearest Ardex Australia Office.

DISCLAIMER

The information presented in this Technical Bulletin is to the best of our knowledge true and accurate. No warranty is implied or given as to its completeness or accuracy in describing the performance or suitability of a product for a particular application. Users are asked to check that the literature in their possession is the latest issue.

REASON FOR REVISION-ISSUER

Content Review, change of company slogan and address

DOCUMENT REVIEW REQUIRED

36 months or whenever third-party suppliers change their recommendations.

Australia: 1300 788 780

New Zealand: 643 384 3029

Web: www.ardexaustralia.com

email: technical.services@ardexaustralia.com

Address: 2 Buda Way, Kemps Creek NSW 2178