

TECHNICAL BULLETIN – TB253

ADHESIVE CONSIDERATION FOR UNSTABLE STONE AND COMPOSITE TILES

Date, Wednesday, 21 February 2018

INTRODUCTION & SCOPE

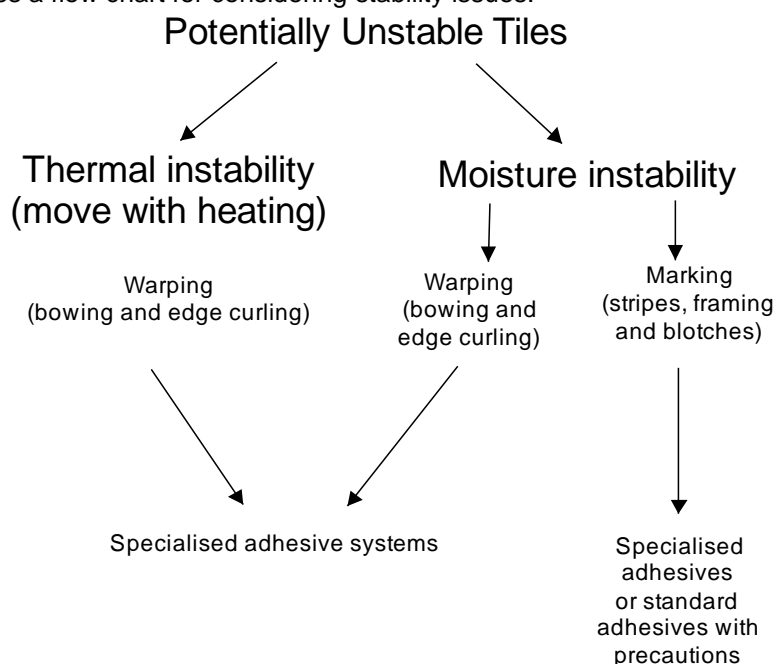
When considering the types of adhesives for bonding sensitive tiles, as described in Technical Bulletin TB010, there are a range of underlying issues and this bulletin highlights the points.

DEFINITIONS

Stable – tiles that are not affected by water and/or thermal heating / cooling.

Unstable – tiles where an effect is caused by water and/or thermal heating / cooling.

This diagram gives a flow chart for considering stability issues.



TYPES OF TILES AFFECTED

The following types of tiles can be dimensional 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 by the tiles displaying more than one mode of instability, though combinations tend to be thermal and moisture warping whilst marking tends to be a single mode. These issues are a consequence of porosity or variable porosity, matrix minerals or binders, and also colour of the tiles in question.

Moisture stability problems can arise from rain, constant washing or even rising moisture. A further complication is that extremely moisture sensitive tiles can be affected by the moisture in the adhesive itself.

Thermal problems are a consequence of heating of the tiles when exposed to solar radiation, both externally or through skylights and large windows. Fireplaces can also be a source of heating.

Thermal effects can occur during adhesive cure, as well during normal service.

Note: * Tiles with polyester resins matrix display chemical instability when exposed to standard cement based adhesives.

DECIDING UPON A FIXING SYSTEM

The first question to be asked for any tile that is potentially unstable is, has it been actually tested or examined for stability? If that information is available, it means a simpler choice can be made, otherwise it may be necessary to conduct some tests or trials to determine the stability. The choices of adhesives are really broken down into three types,

- Standard C Class adhesives (normal 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 needs to be measured, but ARDEX has three general distinctions which are described in detail in Technical Bulletin TB010.

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

Thermally unstable tiles	Moisture unstable - warping	Moisture unstable - marking
High Movement Tiles (>0.4mm) R Class epoxies for any tile type except extreme <i>ARDEX WA100</i>	High Movement Tiles (>0.4mm) R Class epoxies for any tile type except extreme <i>ARDEX WA100</i>	High marking potential R Class epoxies for any tile type except extreme <i>ARDEX WA100</i>
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>	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>	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>
Low Movement Tiles (<0.25mm) C Class adhesives S1 or S2 rating increases resilience (see adhesive list below)	Low Movement Tiles (<0.25mm) C Class adhesives S1 or S2 rating increases resilience (see adhesive list below)	Standard C Class adhesives up to moderate marking potential <i>The following provisos apply</i> <ul style="list-style-type: none"> ➤ That full coverage (100%) is achieved by notching adhesive and back buttering ➤ That initial colour / shade shifts are accepted ➤ That subsequently developed colour / shade shifts are accepted ➤ That colour / shade shifts can be permanent ➤ High marking potential tiles need to be very carefully considered (see adhesive list below)



Standard C Class adhesives 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 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 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 shall be mixed and used in accordance with the recommendations shown on the product datasheet and packaging. Note that the recommendations made herein concerning moisture sensitive tiles with moisture marking potential, supercede those on the packaging and datasheets.

See also

ARDEX Technical Bulletin TB010 Fixing Moisture Sensitive Tiles

ARDEX Technical Bulletin TB238 Resin Matrix Shower Bases

ARDEX Technical Paper TP005 Natural Stone Tile Stability

ARDEX Technical Paper TP19 Natural Stone Tile Stability Part 2

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 or Ardex New Zealand 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

New bulletin. Third revision

DOCUMENT REVIEW REQUIRED

36 months from issue

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