

TECHNICAL BULLETIN – TB154

TILING TO AUTOCLAVED AERATED CONCRETE SUBSTRATES

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INTRODUCTION & SCOPE

Aerated Autoclaved Concrete (AAC) is more commonly known by the trade names CSR Hebel® or YTong (and various other Sino imported products). It is available in block shapes as well as in larger panels suitable for both wall and floor applications. As a lightweight construction material, it has excellent heat and sound insulation properties, is easy to shift on-site weighing approximately one quarter of the weight of conventional concrete, and may cut using hand tools.

However, this lightweight concrete has some different properties compared to a conventional concrete and this bulletin outlines the procedures to use when applying tile finishes with or without a waterproofing system.

CONSIDERATIONS

The Hebel aerated autoclaved concrete has relatively low compressive strength and **low** shear strength compared to normal concrete. It is also relatively porous although it has low permeability (i.e. the rate at which water may pass through the product) as the pores are frequently not interconnected. However its' excellent insulation properties may be reduced if the Hebel concrete becomes saturated.

The Hebel® construction manual also advises that control joints are a necessary part of the their wall and floor panel systems to relieve stresses due to movement of the structural system and to control the locations where movement can occur without detrimental effects on the finishes.

The above considerations affect the application of wall and floor finishes.

- The porous nature of the AAC wall and floor panels' means that more than one priming coat is required prior to the application of bonded finishes.
- In internal wet areas, a waterproofing membrane is required over the floor areas with an applied topping to achieve the required (AS3740) falls to waste outlets.
- Wall panels must be sealed on one side only to allow the AAC material to 'breathe' and expand/contract with changes in the temperature and moisture content in the atmosphere (this applies particularly to external wall finishes).
- Internal wall surfaces are to be covered by sheet linings (plasterboard or fibre cement) to support tile finishes. Heavy (>32kg/m²) tile finishes may adhere to the AAC but failure may occur due to the low cohesive strength of the AAC resulting in the face of the panel separating away.
- Tile finishes are not recommended to be fixed to external AAC panel walls.
- Movement joints are to be maintained over all joints formed in the AAC panel construction. This may require the waterproofing membrane system to incorporate the Ardex Construction Detail bandage over these joints to maintain water tightness.
- The low compressive strength means the Hebel may be susceptible to high point loads. The application of thin applied finishes does not eliminate this

issue particularly if soft resilient floor coverings are to be applied. Hard floor finishes such as tiles will spread the load over a wider area but care must be taken to ensure the adhesive spread is adequate under the tiles. Full coverage of the adhesive under the tiles is recommended.

PREPARATION

The AAC panel surfaces must be suitable for the application of tile finishes. This means they must be flat with all holes or voids filled using the AAC patching mortar or the Ardex A45 system.

Where a levelling layer to floors is required prior to application of a waterproofing membrane or tile finish, apply two coats of the Ardex Multiprime primer, allowing each coat to dry prior to application of the next, then apply Ardex LQ92 mixed with Abalastic (diluted 50:50 in water) to a minimum 5mm thickness. A waterproofing membrane must be applied over the levelling layer in internal wet areas prior to fixing the tiles.

PRIMING

Generally, all AAC surfaces to receive a waterproofing membrane and/or a tile finish are to be primed with two coats of Ardex Multiprime water based primer (waterproof membranes can be used with Ardex WPM265 primer).

It is also feasible to prime with Ardex P9 or Abaprime, however two coats may be required with the first coat diluted 1:1 with water.

Allow the first coat to dry before application of the second coat.

Panels saturated by rain, may require the use of Ardex WPM300 or Ardex WPM368 prior to installation of membranes instead of Ardex WPM265 or Multiprime, to prevent blistering of the membrane.

WATERPROOFING MEMBRANES

The following Ardex waterproofing membranes are fully compatible with the Ardex tile adhesives and may be applied over the Hebel concrete as well as over the sheet wall linings, the Ardex floor levelling compounds.

- Ardex WPM 001 Premixed Bathroom & Balcony (under-tile) membrane
- Ardex WPM002 Bathroom & Balcony (under-tile) membrane.
- Ardex WPM155 Modified polyurethane (under-tile) membrane.

These membranes are to be applied over the prepared and dry primed surface in accordance with the application instructions and in compliance with AS3740. Allow the membrane to fully cure and dry prior to proceeding.

Note: where the membrane is to be applied over a movement joint in the Hebel substrate, the Ardex Construction Detail Tape (see Technical Bulletin TB226) is to be incorporated into the membrane and the position of the movement joint noted so that it may be reformed through any applied bonded topping and/or tile finish.

MORTAR TOPPINGS TO FALLS

Mortar toppings may be required to provide falls to waste outlets in internal wet prior to fixing the tile finishes. A mortar may consist of the following:

- Apply a slurry coat of 2 parts (by volume) of Ardex Abacrete liquid to 3 parts cement and broom thoroughly over the membrane.
- While the slurry coat is still wet, apply a mortar consisting of 3 or 4 parts sand to 1 part cement and mixed with a solution of 1 part Abacrete liquid in 3

parts water. Screed this mortar to achieve the required falls and allow to dry. The minimum topping thickness must be 15mm.

The topping is best applied directly onto the AAC substrate with the membrane applied on top prior to adhesive fixing the tiles as this ensures positive fall to the floor wastes at all times. An acceptable alternative is to apply the membrane first with the screed over the membrane and the tiles adhesive fixed to the screed.

TILE ADHESIVES

Ardex tile adhesives that are suitable for fixing to these various components include the following:

1) Directly to the prepared & dry primed AAC substrate in dry areas only

- Ardex X56 (min. thickness 2.5mm)
- Ardex Isoflex Two Part. (min. thickness 5mm)
- Ardex S28 NEU ± Ardex E90 additive (min. thickness 3mm)

These adhesives must be applied to achieve the minimum (continuous bed) thicknesses under the tiles as indicated above.

2) Adhering tiles to the waterproofing membranes and/or mortar topping screeds

- Ardex X56 (not recommended where ponding water occurs)
- Ardex Abaflex (not recommended where ponding water occurs)
- Ardex Optima
- Ardex STS8 + Ardex E90
- Ardex X18 + Ardex E90 or Ardex Abalastic
- Ardex X77 ± Ardex E90
- Ardex X78 ± Ardex E90

The above adhesives may also be used to fix the tiles to the sheet wall linings if required. We recommend that these adhesives be applied to floors using a (minimum size) 10x10x10mm notched trowel and a 6x6x6mm notched trowel on sheet wall linings. When laying the tiles, occasionally remove tiles and check that the adhesive layer is fully covering the back of each tile, there should be no voids in the adhesive layer. If necessary, use a larger size notched trowel and/or butter additional adhesive directly onto the back of each tile.

GROUT

The tile finishes may be grouted using the Ardex cement based, coloured grouts such as the FG8, FSDD or the WJ50 wide joint grout. These cement based grouts are to be mixed with the Ardex Grout Booster as this additive provides more flexibility to the grouts and increased performance compared to standard cement based grouts.

FG8 grout is recommended for use in joints between tiles from 1 to 8mm wide.

FSDD grout is recommended for use in joints between tiles from 1 to 4mm wide.

WJ50 wide joint sanded grout is recommended for use in joints between tiles from 5 to 50mm wide.

MOVEMENT JOINTS

Movement joints are required in the tile finishes in accordance with the recommendations of AS3958-2007 and as recommended by the AAC panel manufacturer.

This means all movement joints in the AAC substrate must be maintained in the tile finish and be a minimum of 6mm wide. Deep joints are to include a backer rod of closed cell polyethylene or similar (non-absorbent) material so the flexible sealant maintains the recommended thickness to joint width ratio of 1:2 (i.e. the width is twice the sealant thickness)

Ardex SE silicone sealant is recommended for most movement joints in wall and floor tile finishes. This sealant is suitable for installation in sanitary areas and is also UV stable for external applications.

References:

CSR Hebel® Panel Systems

CSR Hebel® Powerfloor system

CSR Hebel® Powerwall system

Ardex Technical Bulletins TB105 and TB226.

Ardex DATA SHEETS for the nominated waterproofing membranes, tiles adhesives, mortar additives, sealant and grout systems.

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

24 month review: Some minor text changes; most references to Hebel changed to AAC. Addition of X18, P9, Abaprime, WPM300, WPM368 and Ardex Construction Detail Bandage, replace S16 with S28 Neu.

REVIEW REQUIRED

24 months from issue.

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