

## BONDING OF “QUARELLA” RECONSTITUTED TILES

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### INTRODUCTION & SCOPE

The Quarella tiles are a large format, reconstituted stone tile bonded with an epoxy resin binder. The tile dimension is 600mm x 300mm x 12mm and sometimes, problems with dimensional stability can occur with these types of large format reconstituted tiles. Ardex Australia Pty Ltd has carried out testing to determine a suitable adhesive with which a bond can be achieved without resulting in serious dimensional variations.

### EXPERIMENTAL

A flexible cementitious based adhesive which produces high, early strength properties was selected as being most appropriate for these trials. ARDEX S28 Neu is such an adhesive, which can be further improved by the addition of ARDEX E90 to provide high bond strength and flexibility.

Prior to bonding the tile, strain gauge reference points were fixed to the upper surface of the tile. These reference points were designed to be used in conjunction with a demountable mechanical strain gauge capable of very accurate measurement of any surface deformations that result after bonding the tile.

The adhesive was prepared using 2 volumes of fresh clean water mixed with 1 volume of ARDEX E90 and mixing up to 7.2 litres of this gauging liquid with 20 kg of ARDEX S28 Neu.

A Quarella tile was then bonded, using the mixed ARDEX S28 / E90 adhesive, to 40MPa concrete in the normal tiling installation manner and allowed to cure. Dimensional movements were then measured, using a mechanical strain gauge, over time to determine the stability of the tiles.

### ASSESSMENT

1. Visual inspection using a straight edge showed no visible deformation over the extended test period.
2. The mechanical strain gauge readings indicated very minor linear movements within the tile. There was slight shrinkage at some points while there was slight expansion on the opposite end.
3. Exposure to the heat lamp resulted in minor shrinkage between most mechanical strain gauge points. Again, there was no visual evidence of tile movement when exposed to the heat lamp.
4. This testing is limited to internal conditions with brief exposure to sunlight. As specified in the product literature, the ARDEX S28 Neu mixed with ARDEX E90 is not recommended in an external exposure application.
5. It was also verified in the laboratory that exposure of ARDEX S28 Neu (mixed with ARDEX E90) to 400 cycles in the weather chamber resulted in adhesion failure while the Quarella tile did not warp or show any visual deformation.



6. A cycle inside the weather chamber consists of 3 hours water condensation and 3 hours heating to 70°C. After the 400 cycles the ARDEX S28 appeared to have increased in volume, which could have created stress on the glue line eventually resulting to adhesive failure.

#### **CONCLUSION**

1. ARDEX S28 Neu plus ARDEX E90 was used to bond Quarella reconstituted marble to a firm substrate.
2. Precise measurements of the dimensional changes were measured showing over 28 days minimal surface distortion across the surface of the tile.
3. Due to time constraints long term dimensional stability of the Quarella Reconstituted Marble could not be determined.
4. There was no distortion in the tile that was visible to the naked eye.
5. The testing and recommendations contained herein are limited to internal dry area fixing only.
6. ARDEX S28 Neu mixed with ARDEX E90 as per the product data sheet is suitable for the bonding of Quarella Reconstituted Marble Tiles.
7. Due to marble being a natural stone the behaviour and properties of the stone can vary and could possibly result in varying dimensional stability results.

#### **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 about specific applications/installations contact your nearest Ardex Australia Office.

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#### **REASON FOR ISSUE**

Review and update information. Replace S16 with S28 Neu

#### **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.

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