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## TECHNICAL BULLETIN – TB070

# BONDING OF “QUARELLA” RECONSTITUTED TILES

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### INTRODUCTION & SCOPE

The Quarella tiles are large format reconstituted stone tiles bonded with an epoxy resin binder. The tile dimensions are 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 tested to determine a suitable adhesive with which a bond can be achieved without resulting in serious dimensional variations.

### EXPERIMENTAL

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

Before bonding the tile, strain gauge reference points were fixed to its upper surface. These reference points were designed with a demountable mechanical strain gauge capable of accurately measuring surface deformations 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 to 40MPa concrete using the mixed ARDEX S28 / E90 adhesive in the normal tiling installation manner and allowed to cure. Dimensional movements were then measured over time using a mechanical strain gauge to determine the tiles' stability.

### ASSESSMENT

1. Visual inspection using a straight edge showed no visible deformation over the extended test period.
2. The mechanical strain gauge readings indicated minor linear movements within the tile. There was slight shrinkage at some points and 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 the product literature specifies, the ARDEX S28 Neu mixed with ARDEX E90 is not recommended for external exposure applications.
5. The laboratory also verified 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 of water condensation and 3 hours of 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 in 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 showed minimal surface distortion across the tile's surface in over 28 days.
3. Due to time constraints, the long-term dimensional stability of the Quarella Reconstituted Marble could not be determined.
4. There was no distortion in the tile visible to the naked eye.
5. The testing and recommendations are limited to internal dry area installation.
6. ARDEX S28 Neu mixed with ARDEX E90, as per the product data sheet, is suitable for bonding Quarella Reconstituted Marble Tiles.
7. Because marble is a natural stone, its behaviour, and properties can vary, possibly resulting 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 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**

**24 months or whenever third-party suppliers change their recommendations.**

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