



TECHNICAL BULLETIN – TB057

INSTALLATION OF SELF-SUPPORTING SAND & CEMENT SCREEDS FOR THE INSTALLATION OF CERAMIC TILING

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INTRODUCTION & SCOPE

In many situations, a self-supporting (unbonded) screed is required to support new tiling installations. These include traditional mesh-reinforced sand and cement screeds or the engineered ARDEX A38 / A48 Rapid Set screed.

This bulletin describes the installation of a self-supporting unbonded screed.

A typical application would be as follows:

- On timber subfloors with excessive movement/vibration and where a rigid subfloor is required to avoid cracking of large format tiles,
- On external balconies/decks constructed of timber or steel framing where a torsional rigid subfloor is required and falls to floor waste are specified,
- Where specific classes of thick fibre-cement sheet flooring are not installed with falls as recommended by the sheet supplier,
- Over lightweight subfloors not strong enough for other bonded toppings,
- Over hi-density foam (thermal insulation and sound insulation) where a sand & cement screed is required before tiling,
- Over waterproof membranes incompatible with tile adhesives or barrier coatings like bitumen and polyurethane membranes.

INSTALLATION RECOMMENDATIONS

1. Lay two layers of PVC sheeting (200 to 300 microns thick on each layer) as a slip sheet between the substrate and the applied sand & cement screed.
2. The second layer of PVC sheeting must be installed at 90° to the previous layer and independent of each other.
3. The individual layers of PVC sheeting should be joined with duct tape or similar. Do not fix the first layer on the top layer or either layer on the substrate. The sheets shall have no creases.
4. A self-supporting screed must be at least 40 mm thick to avoid the risk of cracking. Reinforced sand and cement screeds from 40mm to about 60mm shall be polymer improved using either ARDEX Abacrete (or ARDEX WPM405) liquid additive and may be



prepared using a sand and cement mortar blend. Screeds over 60mm may be prepared using a sand and cement blend bulk filled with equal volumes of 5-8mm aggregate (this becomes a type of granolithic topping - see #8).

5. To prepare a sand and cement screed (40-60mm thick), blend 3 volumes of sand with 1 volume of Portland cement. Prepare a gauging solution by mixing 3 volumes of water with 1 volume of ARDEX Abacrete and combining it with the sand and cement mix to form a stiff-flowing mortar.
6. To prepare the ARDEX A38 screed, mix one 20kg bag of the A38 binder with 100kg of the ARDEX Gravel mix in a horizontal forced action mixer with between 9.5 to 11.0 litres (max.) of water (dependent on the moisture content of the gravel mix) for at least 2 minutes.
7. ARDEX A48 screed is a pre-mixed material handled the same way as A38 regarding mixing and placement.
8. To prepare a bulk-filled sand and cement mortar (also known as a granolithic screed), blend 3 volumes of sand with 1 volume of Portland cement. Then, combine the sand-cement mix with 4 volumes of 5-8mm aggregate. Fresh water may be used as the gauging solution; however, the recommended solution includes liquid polymer additives.
9. Improved results will be obtained using the ARDEX Abacrete (or ARDEX WPM405) gauging solution described in #4 above.

Note: The ARDEX A38 / A48 screed does not require liquid additives and can be applied to 100mm thickness.

10. The sand and cement screed must be reinforced using a galvanised steel mesh, as recommended in AS3958. For screeds up to 60mm, a minimum 1.2mm diameter mesh with 25mm spacing is recommended, while a 3-5mm diameter mesh is recommended for thicker screeds.

Note: ARDEX A38 / A48 Rapid Set Screed does not require additional reinforcement and can be applied up to 100mm thickness. Ensure the screed is fully compacted.

11. Lay the sand and cement mortar or bulk fill to half the required thickness. Place the reinforcing mesh over the laid screed. Finally, lay the remaining mortar or bulk fill over and through the reinforcing steel and finish using a wood float. Ensure the mortar is fully compacted, as any voids around the mesh reduce the integrity of the screed.
12. Expansion and movement joints should be installed in a grid pattern of not greater than 4 meters externally and overall movement joints in the substrates per the recommendations of AS3958.1-2007.

Note: ARDEX A38 / A48 Rapid Set screeds shall be laid in panels of approx. 40m² each.

13. Sand and cement screeds of 40mm thickness must be allowed to cure/dry for 7 days before applying membranes or adhesives. Thicker screeds should be allowed to cure longer (for example, 100 mm requires 21 days).



ARDEX A38 / A48 Rapid Set screeds are ready for tiling after 8 hours drying. Allow 48 hours for drying before leveling cement and/or resilient (e.g., vinyl) floor coverings.

14. To work on “green” sand and cement screeds before the recommended curing time has been completed, apply ARDEX WPM300 (or ARDEX WPM368) at a coverage rate of not greater than 3 square meters per litre per coat (0.3mm wet film thickness) as a barrier coating and allow curing to a scratch-hard finish. Two coats may be required to ensure a continuous moisture barrier, although prolonged drying may occur.
15. If the ARDEX WPM300 (or ARDEX WPM368) moisture barrier coating is not used, the sand and cement screed should be kept moist for at least 48 hours after installation to minimize cracking due to rapid drying.
16. The self-supporting unbonded sand and cement screed shall be cured in accordance with AS1303-4 and allowed a minimum of 7 days of drying at 20°C and 50% R.H. before tile work commences.

Glossary

Bonded—The overlying topping system is adhered directly to the underlying waterproofing or substrate. There is no fixed upper limit in thickness, but the minimum thickness for a sand-cement screed is 15mm, and engineered screeds are 10mm minimum. Smoothing cements can go up to 1mm thick.

Cementitious—This simply means the topping system contains ordinary Portland cement or other specialised hydraulic cement, such as High-Alumina cement.

Concrete – A composite material composed of coarse aggregate bonded together with a fluid cement which hardens over time. Most concretes used are lime-based, such as Portland cement concrete, or concretes made with other hydraulic cement (<https://en.wikipedia.org/wiki/Concrete>). It would be clear that smoothing cements and their related bulk fills could be loosely called concrete.

Engineered cement— This term refers to proprietary mixes of hydraulic cement with other powders and additives designed to create a higher-performance binder system than simple Portland cement. ARDEX dry powder smoothing cement, mortars, and related products are engineered cement.

Engineered screed— This refers to screeds made with engineered cement powders and selected aggregate-sand mixes. The binder's higher performance allows these screeds to have higher sand-aggregate ratios, faster cure, and greater final developed strengths. ARDEX A38 is an engineered screed system based on a specialised cement powder and separate sand-aggregate mix. ARDEX A48 is a pre-bagged and mixed version of this material.

Granolithic screed - A specialised type of sand-cement + aggregate screed, where a sand-gravel mix replaces the sand with a size range of typically 0-4mm in most usages. More generally, though, when used as ‘faux concrete’, the coarse aggregates are well graded, and the particles range from 13 mm to 0.06mm. The granolithic flooring concrete mix is generally in the proportion of 1:1:2 or 1:1:3 by cement-aggregate-sand weight (<http://www.theconstructioncivil.org/granolithic-flooring/>). The overall ratio is 2.5:1 filler-cement by volume, making it more binder-rich than normal sand-cement.



These 'screeds' compact more effectively and often have higher strengths than standard sand-cement screeds. The ratios may be varied where the aggregate used differs in size.

Screed—This term is used generically to refer to many types of applied surface toppings, but more strictly speaking for our industry, we believe it refers specifically to sand-cement screeds of the type described for tile bedding in AS3958.1-2007.

That means a mixture of Portland cement and clean sand (~0.15-0.5mm) mixed in the ratio of ~3-4:1 sand to cement by weight. Screeds may use coarser grades of sand and thus transition into granolithic screeds.

Self-leveling cement— Synonymous with self-smoothing cement, leveling cement, and floor-leveling cement. Specifically, the term underlayment is defined in AS1884-2012 to describe these products, which are invariably liquid-engineered cement toppings. These materials should never be confused with sand-cement or granolithic screeds, as they have completely different properties.

Topping - A generic term that can refer to screeds, mortar beds, smoothing cements, and even new thin concrete slabs. It has no specific product material or system identification associated with it and should only be used for low-level descriptions of installed beds on floors.

Un-bonded—The overlying topping system is not adhered directly to the underlying waterproofing or substrate and floats on a bond-breaking sheet. The nominal minimum thickness is 40mm for sand-cement screeds, though engineered screeds can go down to 35mm with higher binder ratios. Non-engineered screeds contain reinforcement mesh. Liquid smoothing cements and their related bulk fills cannot be laid unbonded.

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.

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