



TECHNICAL BULLETIN – TB243

SCREEDS AND WATERPROOFING MEMBRANES

29th August 2024

INTRODUCTION & SCOPE

Some membranes are compatible with cementitious toppings (and/or tiled finishes), and some are not. Most leveling compounds cannot be applied over flexible membranes as bonded systems, but some can. ARDEX Technical Bulletin TB199 discusses this more.

This bulletin is a brief introduction to membranes for use with either bonded or unbonded toppings and should be read in conjunction with ARDEX Technical Bulletin TB244 Screed Systems.

DEFINITIONS

Bonded – The overlying topping system is adhered directly to the underlying waterproofing or substrate.

Cementitious - Means the topping system contains ordinary Portland cement or other specialized hydraulic cement, such as High-alumina cement.

Engineered cement – 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 cements, mortars, and related products are engineered cements.

Engineered screed – Refers to screeds made with engineered cement powders and selected aggregate-sand mixes. ARDEX A38 is an engineered screed system.

Granolithic screed - A specialized type of sand-cement screed, where the sand is replaced by a sand-gravel mix with a size range of 0-4mm. The ratio is 3-4:1 as with normal sand-cement mixes. These screeds compact more effectively and often have higher strengths than standard sand-cement screeds.

Membrane—This is used to describe waterproofing products compliant with AS4858 / AS3740 / AS4654 that are designed to prevent the penetration of water from above the membrane. This means positive-side water, such as rain or spray from showers, etc. Most materials of this type are Class II or Class III to AS4858 and can be sheets.

Moisture barrier – Used to describe waterproofing products compliant with AS4858 and AS2870 designed to prevent water penetration from below the barrier. This means negative-side water, such as rising dampness or residual moisture in screeds and concrete. Most materials are Class I to AS4858 or are plastic sheet materials.

Screed - Often used generically for many types of applied surface toppings but refers specifically to sand-cement screeds of the kind described for tile bedding in AS3958.1-2007. That means a mixture of Portland cement and clean sand (~0.3-0.5mm) mixed in the ratio of ~3-4:1 sand to cement.

Leveling compound – *Synonymous with self-smoothing cement and floor-leveling cement.* Specifically, the term *underlayment* is defined in AS1884-2012 to describe these products, which are engineered cement toppings. These materials should never be confused with sand-cement or granolithic screeds.

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 and should only be used for low-level descriptions of installed beds on floors.

Unbonded: *The overlying topping system is not adhered to the underlying waterproofing or substrate and floats on a bond-breaking sheet.*



WATERPROOFING MEMBRANES & MOISTURE BARRIERS

Waterproofing membranes and barriers may be liquid-applied systems or sheet membranes. For more specific details on specific materials, see ARDEX Technical Bulletin TB113.

Liquid-applied membrane systems include (but are not limited to) the following:

- Acrylic-based and acrylic/polyurethane blended premixed flexible products
- Acrylic/cementitious two-part flexible products
- Rubber latex-based premixed (i.e., SBR) and two-part flexible products
- Bituminous rubber latex premixed & spray-applied two-part flexible products
- Polyurethane premixed flexible products
- Polyurea spray applied semi-rigid membranes
- Epoxy resin-based semi-rigid membranes

Where bonded toppings are to be installed, liquid-applied membranes such as the acrylic and rubber latex-based (excluding the bituminous latex membranes) systems are generally compatible with cementitious sand-cement or granolithic screeds and/or tile adhesives.

Some liquid-applied moisture barriers (e.g., epoxy-based systems) can be successfully treated by “sand seeding” when newly applied so that the sand provides a mechanical key for the applied topping.

However, the “sand seeding” of polyurethane membranes has been much less successful and is not an ARDEX-recommended solution for bonded toppings. Other liquid-applied resin-based membranes, including most polyurethane systems, are unsuitable for bonded toppings, although they may be used with unbonded sand-cement or granolithic screeds.

Sheet membranes may include (but are not limited to) the following:

- PVC and EPDM sheet
- Butynol Rubber Sheet and modified under tile variants
- Polyolefin (TPO) sheet (other than PVC or Butynol)
- Bituminous sheet (Self-adhesive or Torch applied)

Only the Butynol rubber sheet membranes modified for under-tile applications are suitable for bonded topping screeds.

All other sheet membranes can be used with un-bonded toppings.

BONDED VERSUS UN-BONDED SCREEDS

Bonded screed installations are the most common as they allow the minimum thickness (15mm) to be applied, thus limiting the weight load on the structure.

The substrate is generally concrete, although it may be a membrane system applied over concrete that is compatible with cement-based toppings.

Bonded screeds are generally applied with a bonding slurry coat consisting of a liquid polymer additive (e.g., acrylic or SBR rubber latex such as ARDEX Abalastic or ARDEX WPM405) mixed with cement. The bonding slurry is broomed thoroughly over the dry membrane, and the mixed wet screed mortar is applied over the still-wet bonding slurry. The liquid polymer additive is diluted with water and mixed into the screed mortar.



Un-bonded screeds are not bonded to the membrane and thus act to isolate the topping screed from substrates that may be contaminated, cracked, or constructed with movement joints that would be unacceptable in the new floor coverings. Because they are unbonded, they also have to be self-supporting. This generally means sand-cement, or granolithic screeds will include welded wire mesh reinforcement with a minimum thickness of 40mm.

However, specialist-engineered toppings such as the ARDEX A38/A48 Rapid Set engineered screed can be applied at a minimum 45mm thickness and do not require additional reinforcement. However, they are limited to approximately 40m² panel/bay size, with large areas to be installed in several panels/bays.

Unbonded systems are placed over a slip sheet (e.g., a double-layer plastic sheet 200 micron—0.2mm thick for each layer), with the top layer of plastic placed at right angles across the base layer.

Thus, the sand-cement or granolithic (bonded or un-bonded) screeds and the ARDEX A38/A48 (**un-bonded only**) toppings are the only approved systems applicable over a liquid-applied waterproofing membrane.

Waterproofing membrane. Bonded screeds, but not A38/A48, can only be used over fleece-faced sheet membranes such as ARDEX WPM750 or WPM1000.

Whether the screed is bonded or unbonded, it must be compacted to ensure close packing and maximum strength development. However, sand-cement screed mortars and the ARDEX A38/A48 Rapid set screed must be compacted during installation, especially when the topping thickness exceeds 40mm. This ability to adequately compact the mortar can limit the maximum effective thickness.

Note: *Levelling compounds* are not suitable for application over waterproofing membranes, although they may be applied to prepared concrete substrates as bonded toppings and subsequently protected by an applied membrane. They can be used over appropriate Class I moisture barriers such as epoxies.

Leveling compounds are generally applied as liquid mortar and thus can be left to settle without further compaction. They are normally used as leveling/smoothing toppings directly onto prepared concrete substrates where flat surfaces are required. Aggregate may be added to some self-leveling compounds that will allow the formation of minor fall to drainage. However, these products must be protected from moisture penetration by an applied membrane

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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