



TECHNICAL BULLETIN – TB178

PREPARATION OF WALLS & FLOORS IN WET AREAS OF HEALTH CARE FACILITIES AND INSTITUTIONS TO RECEIVE SHEET VINYL COVERINGS USING ARDEX FLC WATERPROOF MEMBRANES AND ADHESIVES

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INTRODUCTION & SCOPE

It is imperative to eliminate trip hazards when entering wet areas and the shower while maintaining falls to floor wastes.

Nonengineered sand-cement screeds require a minimum thickness of 15-25mm and at least 1 day of drying time per millimetre thickness. They are rarely smooth enough or sufficiently strong (often less than half to one-third the strength of the subfloor) before fixing resilient flooring.

An ARDEX cementitious topping is typically installed from 20-30mm to a featheredge at the floor waste and dries rapidly. This allows sheet vinyl flooring to be fixed typically within 16-18 hours and provides high strength.

The turnaround time factor can be critical, and systems are available with various cure times to suit project needs. For the fast-track systems, resilient flooring can be laid as early as 1 - 1½ hours over ARDEX A45 or ARDEX K55 or from 16-24 hours for ARDEX K15 and ARDEX K12.

The critical requirements of any floor preparation material are: -

- Must be able to dramatically reduce the need for thick sand/cement screeds to create falls to floor waste with the resultant ramps at adjoining entranceways. In new construction, structurally formed set downs (wet areas) are no longer required.
- To maintain a waterproof system in wet areas that conforms to the National Construction - Australian Building Code for Class 3 and 9 buildings to AS3740, compatible with sheet vinyl coverings.
- Falls within the requirements of AS1884-2012 in section 5.2 for wet area resilient flooring.
- All products for preparing wet area surfaces must be readily available, reliable, easy to use, and safe. They should offer long-term guarantees, be available from one manufacturer, and have rapid hardening and drying properties, allowing for the most cost-effective construction with quick installation times.

This bulletin describes methods for installing a complete system, including leveling or the creation of falls and membranes.

CREATING FALLS TO WASTE

Selected ARDEX Floor levelling, repair and re-modelling cements allow the installation of rapid hardening, rapid drying cement fills and screeds for falls to floor wastes. These products can be used from featheredge to 20mm for unfilled levelling compounds and 3-90 mm for bulk fills and engineered screeds, providing the minimum required thickness to achieve falls for a typical 900 x 900mm shower floor area.



Areas adjacent to the shower can also be ramped (back to floor waste), allowing only a moderate height build-up to adjoining dry areas. Trip hazards can be easily removed by ramping the same product into dry areas with a shallow gradient, allowing easy and safe passage by healthcare facility users.

Alternately, in new construction, falls to floor wastes (shower areas) must be created during construction. Roughly created falls can be quickly, easily, and cost-effectively smoothed before the installation of sheet vinyl flooring.

The specification of this system can allow flexibility in design, with the location and installation of wet areas able to be altered at any time.

Advantage: No need for set downs or falls to waste in the structural concrete subfloor.

WATERPROOF MEMBRANES

The waterproofing standard AS3740 describes sheet vinyl flooring as water-resistant rather than waterproof. This is because of the joining process of the sheets with welded joints. The difference between the two is defined in the standard as:

Waterproof – The property of a material that does not allow moisture to penetrate through it when tested in accordance with AS/NZS 4858.

Water resistant – The property of a system or material that **restricts** moisture movement and will not degrade under moisture conditions.

This distinction is significant in the standard's General Requirements, where shower areas (enclosed and unenclosed) and bathrooms and laundries with floor wastes require the floor to be waterproof rather than water resistant.

This means that while normal vinyl flooring is water resistant, it is not waterproof, so a separate membrane system is required. It should be noted that some flooring suppliers have nominally waterproof sheet flooring systems.

SURFACE PREPARATION

1. Concrete floors must be structurally sound with all previous coatings removed, clean and free of oil, grease, wax, latex compounds, curing compounds, efflorescence, laitance, dust, and all foreign matter, back to an open porous matrix of the concrete. Professional cleaning by mechanical means in line with sound building industry practices is advised. Suggested processes include diamond grinding or, if large areas scarifying or shot blasting to provide a surface profile between CSP3 to CSP7. Refer to Technical Bulletin TB041 for more details.
2. Vacuum the surface to thoroughly remove all dust, dirt, and debris from surface preparation, etc.

Note: ARDEX considers standard sand-cement screeds inappropriate substrates for vinyl flooring. The basic reasons are related to slow drying, difficulty obtaining a smooth surface, and, unless carefully mixed and compacted, screeds have poor strength and indentation properties in the longer term, which can lead to subsequent problems with the floor. If a screed is required, ARDEX A38 and A48 are rapid-cure and strong engineered screeds.

For more details, refer to ARDEX Technical Bulletins TB159 and AS1884.

PRIMING BEFORE RAPID CURE CEMENT BASE

1. The primer for standard absorbent concrete is ARDEX P51 diluted 1:2 with water.



2. Mix ARDEX P51 primer 1:2 with water and apply evenly with a soft push-broom. Do not leave any bare spots and remove all puddles and excess primer. Allow to dry to a clear, thin film (min., 3 hours, Max., 24 hours). The cementitious topping should not be applied until the primer is dry.

Note: Alternate primers for the levelling compounds in special situations include ARDEX P9, ARDEX WPM300 with broadcast sand, ARDEX WPM368, and ARDEX PU30 sand broadcast.

ARDEX P9 is applied by roller onto clean surfaces. It can be used on mechanically prepared concrete with less porosity than required for ARDEX P51.

ARDEX WPM300 is part of the moisture barrier system described in Technical Bulletins TB006 and TB192. ARDEX PU30 sand blinded can be used as a green slab seal primer.

ARDEX WPM368 is applied by roller and acts equivalently to ARDEX WPM300, except that broadcast sand is not required. This primer/moisture barrier should not be substituted for ARDEX WPM300, where the substrate is highly saturated, as curing is delayed in these cases.

SYSTEMS TO CREATE BASE AND FALLS TO WASTE

The following systems are suitable for creating falls and smoothing the surface before membrane installation.

The Ultra-rapid and Rapid cure systems are intended for 'fast track' installation. However, they require protection from long-term moisture exposure.

- 1) Where ARDEX leveling compounds have been bulk-filled with aggregate, a final coat of neat leveling compound is required to remove the rough and lumpy surface that bulk-filled layers have. After the base coat has cured, a coat of ARDEX P51 primer diluted 1:2 with water is applied to the surface and allowed to dry for approximately 3 hours.
- 2) It may be necessary to install pins in the concrete (adjusted by a string line) to act as a guide when installing levelling compounds. The gauge water/ E25 mix quantity can be adjusted slightly to adjust workability as a screed.
- 3) An alternative method is to place a circle of foam tape approximately 300-400mm from the floor waste and then apply the bulk fill from the wall to the outer edge of the foam tape. When the bulk fill is cured, the tape is removed, and the final section from the hardened edge to the waste is laid with levelling compound or a patching mortar without aggregate.



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Table 1) Ultra-rapid Cure Systems

Product	ARDEX E25	Thickness	Cure times	Advantages	Limitations
System 1.1 ARDEX K55	Nil	① Added equal volume of aggregate 2-5mm to minimize flow. Any thickness	60-90 minutes	-Very fast cure allows rapid turnaround times - High strength	-Very high flow without aggregate restricts the ability to create falls
System 1.2 ARDEX A45	Gauge solution is 1 volume of ARDEX E25 to 2.5 volumes of water. 1 volume of gauge solution to 3 volumes of ARDEX A45 powder	a) 1-5mm neat A45 b) Thickness 2mm to 30mm ARDEX A45 mortar can be bulked out ① 1/3 volume 0.3-0.5mm sand 1 volume 2-5mm aggregate c) Between 30-50mm 1 volume 10mm aggregate.	90 minutes	-Very fast cure allows rapid turnaround times -High strength -Good formability	-When bulk-filled, it is stiff to mix. -Mixing large volumes creates a short working time

Table 2) Rapid cure systems

Product	ARDEX E25	Thickness	Cure times	Advantages	Limitations
System 2.1 ARDEX K15	1.6 litres of ARDEX E25 to 4 litres of water per 20kg bag	① Adding an equal volume of aggregate 2-5mm is recommended to minimize flow. Any thickness	16-18 hours	-Fast cure allows rapid turnaround times. -No thickness restrictions -High compressive strength	-High flow without aggregate restricts the ability to create falls
System 2.2 ARDEX K12 New	1 litre of ARDEX E25 to 4.5 litres of water per 20kg bag	① Adding an equal volume of aggregate 2-5mm is recommended to minimize flow. Up to 35 mm without aggregate and with 2-5mm gravel for thicker layers	16-18 hours	-Fast cure allows rapid turn-around times. -High compressive strength	-High flow without aggregate restricts the ability to create falls.



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System 2.3* ARDEX A38 or ARDEX A48	No additive required	As bonded screeds 15-70mm and unbonded 40-70mm (can be several layers to 120mm)	16-18 hours	-Fast cure allows rapid turn-around times. -High compressive strength -Economical in depth	-Screed rather than levelling compound Requires compaction
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Table 3) Moderate cure time systems

Product	ARDEX E25	Thickness	Cure times	Advantages	Limitations
System 3.1 ARDEX K900 BF	N/A	① Any thickness from 3-90 mm	48 hours	-Cures much faster than screeds -High thickness possible -Water-resistant -Good bulk fill base for other topcoats	-Slower cure dependent on thickness -Does not feather out
System 3.2* ARDEX K60	Not required	a) ARDEX K60 is suitable for ramping to drains in one operation without filler. b) ① For thickness 10-30mm, it is recommended to add an equal volume of aggregate 2-5mm	24 hours	-Water-resistant -Flexible, so good for CFC floors -Easier to form without aggregate	-Softer than other smoothing cements -Maximum recommended thickness 30mm
System 3.3* ARDEX A46	NA	2-30mm	24 hours	-Good formability -Water resistant – External product	Maximum recommended thickness 30mm
System 3.4* ARDEX K301	NA	a) 2-20mm b) ① For a thickness of 10-30mm, it is recommended to have an equal volume aggregate 2-5mm	48-72 hours	-Water resistant- External product -Hard surface	-Maximum thickness 20mm -Rough surface texture -Main application is wear surface



*These base systems are not moisture-sensitive.

PLACEMENT WITH FALLS TO FLOOR WASTE

The bulk-filled levelling compounds can be screeded or trowelled to the required fall or gradient (between 1 in 60 and 1 in 100), with approximate minimum thicknesses typically 8 mm to 10 mm.

Where using neat ARDEX A45 and ARDEX A46 trowelable mortars, falls can be formed easily with a hand trowel. ARDEX A38/A48 can be screeded by traditional methods.

When using the neat levelling compounds ARDEX K12, ARDEX ARDITEX NA, or ARDEX K301, the amount of fall that can be created is restricted by the maximum build height that can be achieved.

Allow the mortar to harden to "FINGER TIGHT," then proceed to shape the mortar to the required fall to provide a flat finish by shaving or grinding the surface with a trowel blade or similar tool.

WATERPROOF PROTECTION COATING FOR LEVELLING COMPOUND

The application of the ARDEX membrane when installed in showers shall be continued as per AS3740 and AS1885-2012:

- up the internal corners to a height of 1.8 metres and 40mm on either side of the junctions, assuming that walls are water resistant construction (this does not preclude full waterproofing of walls if desired)
 - up wall surfaces for a minimum height of 150mm
 - above the bath level for 150mm
 - for floors of un-enclosed showers out to a minimum distance of 1500mm from the shower head
 - For floors with wastes, over the whole floor.
1. ARDEX WPM002 is the recommended membrane for heavy-duty applications and where more chemically aggressive vinyl adhesives are to be used.
 2. For less demanding applications, ARDEX WPM155 Rapid Plus or ARDEX WPM130 can be used in its place. However, it must be recognized that WPM155 Rapid Plus and WPM130 are somewhat slower to cure than WPM002.

NOTE: The ARDEX WPM155 Rapid Plus and WPM130 system film thickness MUST be 1.0mm or greater.

NOTE: Using ARDEX STB tape with WPM155 Rapid Plus is optional but at your own risk. The fairing coat may crack over the tape joints, and show-through may also occur. The thickness of the fairing coat in these sections is also an issue. Neutral-cure silicone as the bond breaker in internal corners with Deckweb embedded in the membrane over the bond breakers is the recommended application.

3. Allow the base coat of the levelling compound to harden and dry, see recommended cure times in tables, before applying the waterproof protective coating
4. The levelling compound surface should be primed with ARDEX WPM265 Water-Based Primer or ARDEX P9 (preferred primers for ARDEX WPM002, ARDEX WPM155 RP and ARDEX WPM130), but other suitable options based on product availability include ARDEX P51 diluted to 1:2 with water, ARDEX WPM300, or ARDEX MULTIPRIME.



5. A bead of elastomeric sealant (e.g., ARDEX ST neutral cure silicone) or bond-breaking tape is applied as a bond breaker to the following areas:
 - Floor-wall junction
 - Expansion joints, floor/wall junction within shower trays
 - Joins in flooring and other places where movement is expected
6. Build enhancing elastic fabric scrim to carry the membrane over all joints and around penetrations to be ARDEX Deck Web 190mm wide.
7. The waterproof membrane should be installed as per the product Technical Datasheet on all finished surfaces.
8. Allow ARDEX WPM002 to cure for at least 4 hours at 23°C/50% RH before installing ARDEX FEATHER FINISH or ARDEX FINE FINISH.
9. ARDEX WPM155 Rapid Plus or ARDEX WPM130 should be allowed to cure for at least 18-24 hours before application of ARDEX FEATHER FINISH or ARDEX FINE FINISH.
10. Where the vinyl is turned up the walls, details such as coves are required, and the fairing coat must be continued up the height of the membrane and then overlapped onto the wall construction to produce a smooth transition.

Note: Where ARDEX WPM155 Rapid Plus or ARDEX WPM130 has been used instead of ARDEX WPM002, it is not as resistant as the cement containing ARDEX WPM002 where solvent-based contact adhesives are used (can result in transient softening of the membrane).

ARDEX cannot offer guarantees for installations over non-ARDEX membranes unless tested by ARDEX for compatibility.

FINISHING COAT FOR DIRECT FIXING OF VINYL – FEATHER FINISH

The flexible smooth cement should be ARDEX FEATHER FINISH or ARDEX FINE FINISH.

The finishing coat aims to improve the performance of tack-off type water-based adhesives, provide some protection for the membrane surface, and hide the rough texture of the membrane to prevent show-through.

1. ARDEX FEATHER FINISH to be mixed 2 parts powder to one part water with an ARDEX mixing paddle and electric drill.
2. Apply FEATHER FINISH or ARDEX FINE FINISH mortar using a 1.6 to 2.4mm notched trowel, then smooth using a flat trowel to provide a flat/smooth porous surface. This can be done as a single coat, which is trowelled smooth, but the application of a second coat after the first has dried is more effective.

The required minimum thickness for floors is 1.5mm

The recommended minimum thickness for walls is 1.0mm

3. The fairing coat can cover the membrane's edge and provide a wedge-shaped transition on the walls where the vinyl is turned up.
4. Allow the ARDEX FEATHER FINISH smoothing coat to dry thoroughly before installing resilient vinyl sheeting (at least 3 -6 hours at 20 C).



FINISHING COAT FOR DIRECT FIXING OF VINYL – ARDEX K60

In some situations, a thicker build is required; in this case, ARDEX K60 can be installed over the membrane. It is also more resistant to solvents than a thinner layer of ARDEX FEATHER FINISH, so can give extra protection where contact solvent adhesives are in use.

1. The self-smoothing latex-based underlayment should be ARDEX K60.
2. Install ARDEX K60 at a minimum thickness of 3mm to the dry waterproof membrane and allow it to dry thoroughly (minimum 24 hours) before installing vinyl finishes.

Note that ARDEX K60 cannot be run up walls and in this case a coat of ARDEX FEATHER FINISH is required to smooth the wall areas.

FLOORING ADHESIVES

Resilient flooring can be installed over various adhesive products; however, the adhesives must comply with the floor covering manufacturer's recommendations for appropriate types.

The most moisture-resistant adhesive used is typically a two-part epoxy adhesive. However, it has a poor initial grab, which can lead to problems with some types of floor waste. Water-based acrylic adhesives are subject to moisture damage when the vinyl joints leak and also require correct tack-off time. Solvent-based contact adhesives provide fast grabs but can be long-term moisture-sensitive. Depending on the solvent type, they may affect the membrane and may not be recommended by floor covering manufacturers.

Adhesive systems for the vinyl installation would include:

1. Bonding the vinyl to the floor and walls with ARDEX AF180 MS adhesive, making sure the product has correctly tacked off before laying the vinyl to prevent moisture being trapped.
2. The plastic floor waste turndown and the area within ~100mm can have the coverings bonded with the contact adhesive ARDEX CA750. To prevent solvent damage to the membrane the contact adhesive must correctly tack off before the covering is placed.
3. Where mouldings and fittings are to be bonded to the walls (typically where the vinyl finishes on the turn-up) or the corner covings, ARDEX CA750 can be used, again allowing the correct tack-off time.
4. Mouldings or skirting trim can also be bonded with ARDEX CA-20P silane adhesive and sealant. The adhesive can be activated faster by misting with water before placing the piece to be bonded. This adhesive is not designed as fast grab; heavier items may require support. The adhesive is solvent-free.

DAMP SLABS

Where the concrete subfloor's moisture content exceeds the requirements of AS1884 – NZS/AS1884, the floor should be treated with ARDEX WPM300 as per ARDEX Technical Bulletins TB006 or TB192 (or ARDEX WPM368).

When following Technical Bulletin TB006, please note that not all levelling compounds listed in the systems above can be used with ARDEX P82 primer.

TIMBER FLOORS



These systems are not considered suitable for use over timber based floors. While it is possible to waterproof floors made of particle board and plywood, strip timber floors are classified as not suitable under the standard.

SAND-CEMENT SCREEDS

For cost reduction reasons, sites are being specified with sand-cement-type screeds in the wet areas as the base. These are covered under AS3958 for the purposes of application and design. However, these screeds have a number of issues that can make this a false economy. As per AS1884.2021, an engineered screed is now required when a screed is to be used in the wet areas as the base. Sand-cement-type screeds are no longer acceptable and, if installed, do not comply with Australian standards.

REFERENCES

AS3740-2021 Waterproofing of wet areas within residential buildings.
AS/NZS4858-2004 Wet area membranes
AS1884-2021 Floor coverings—Resilient sheet and tiles—Installation practices.
NZS/AS1884-2013 Floor coverings—Resilient sheet and tiles—Installation practices.
ARDEX Technical Bulletin TB012D; Systems for Preparation of Walls & Floors in Wet Areas of Health Care Facilities to Receive Sheet Vinyl Coverings, ARDEX FLC and Membranes.

GLOSSARY

AS3958.1-2023 Ceramic tiles

Part 1: Guide to the installation of ceramic tiles.

Bond breaker – A system that prevents the membrane from bonding to the substrate, bedding, or lining.

Bulk-filled—A liquid or paste smoothing cement that has had aggregate or coarse sand added to it to add bulk and alter the handling properties (usually to reduce flow).

Feather edge: where the smoothing cement is wedged, it is a fine and thin transition, typically 1mm or less in thickness.

Finger tight—The mortar is firm to the touch and does not easily deform or slump, but it is still soft enough to work and shape with a trowel or a dampened trowel.

Granolithic topping – A type of “sand”-cement screed where the sand is actually a mixture of sand (0.05-2mm size) and fine gravel between 2-5mm normally, which is mixed with cement and laid in the same sort of way as a normal sand-cement screed. The range of particle sizes makes these screeds stronger than the typical fine sand-only screeds.

Leveller– also called smoothing cement, floor levelling cement, topping, or the standard term underlayment. These are typically poured liquids but can also be mortar pastes.
AS4858/AS740 or AS2870.

Mechanical method-As defined in AS1884-2021 is, “1.3.15 *Mechanical means*.”

‘Mechanical means’ is the surface preparation process by applying physical forces to the substrate surfaces to remove contamination. For the purposes of installations on concrete, this refers to the use of diamond grinders, scarifiers, and captive shot blasters. For smaller areas, this can include chippers and nail gun-type scabblers. When installations are to be performed on timber floors ‘mechanical means, refer to floor sanders. Regardless of the means used, the final process in a mechanical preparation is vacuum cleaning.’

Resilient flooring: Sheet and tile coverings in all forms, including flexible PVC, semi-rigid PVC, linoleum, and rubber.

Moisture Barrier—This term refers to a waterproofing membrane that prevents rising moisture from the substrate. It can be either liquid water or water vapour. These can be full under-tile Waterproofing membranes. The term membrane is the general covering name for all sorts of waterproofing. Still, in this case, it is taken to mean flexible membranes compliant with AS4858 and designed to stop water from penetrating from above the flooring.

Wet areas – An area within a building supplied with water from a water supply system, which includes bathrooms, showers, laundries, and sanitary compartments and excludes kitchens and bar areas, kitchenettes, or domestic food and beverage preparation areas. (From AS3740-2021).



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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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