TECHNICAL BULLETIN – TB119

WATERPROOFING INTERNAL WATE RESISTANT PARTICLEBOARD FLOORS

22nd July 2024

INTRODUCTION & SCOPE

With the trend towards using cheaper and easy-to-install building materials, more floors in wet areas, particularly on second stories of domestic dwellings, have been laid with water-resistant particleboard flooring. In other cases, there may be an existing tongue and groove timber floor where a renovation is undertaken.

A commonly received inquiry to ARDEX Technical Services involves applying a waterproof membrane system suitable for tiling in these situations. This bulletin will examine some systems that could be used in these cases.

WATERPROOF MEMBRANE SYSTEMS

Whilst timber-based products may be classed as water resistant, they still display high moisture movement changes and can, over time, degrade where moisture may penetrate. For these reasons, ARDEX recommends that, where possible, normal Compressed Fibre-Cement Sheet or proprietary products such as James Hardie Scyon™ (TB215) are a preferable substrate in these applications and provide a better surface for membranes and tile adhesives.

A range of basic systems could be applied to internal floors depending on the risk factor.

LOW TO MEDIUM-RISK AREAS (MAIN FLOORS IN BATHROOMS, WC, OR LAUNDRIES WHERE THERE ARE NO FLOOR WASTES)

Option A

Direct application of the membrane to the timber surface is the least preferred method, as any damage to the membrane during subsequent procedures will allow water to penetrate. Also, moisture vapour will breathe through, causing condensation on the timber, resulting in movement and possible decomposition, mould, rot, and decay.

If the floor has falls built in the tiles are applied to the membrane surface, but if not a screed is required.

(It is generally preferable to over sheet with fibre-cement sheet and apply the membrane to that instead, followed by a suitable screed if falls are not already in place).

HIGH & MEDIUM RISK AREAS (SHOWER ENCLOSURES AND AREAS WHERE THERE IS A FLOOR WASTE AND FALLS)

Option B

It uses a Forticon plastic sheet overlay on the timber, which can then have a 40mm thick rapid-cure screed applied, followed by the membrane. The plastic sheet isolates the screed from the timber.

Option C

It uses a fibre-cement sheet overlay on the timber, which can then have a rapid cure screed or bulk-filled smoothing cement applied, followed by the membrane. The screed is actually bonded to the fibre-cement sheet.

Option D

It uses a Forticon plastic sheet, followed by a traditional self-supporting 40mm thick sand/cement screed reinforced with Y5 welded steel mesh and a liquid-applied membrane.

Option E

Application of a Hydrepoxy barrier to the timber followed by a traditional self-supporting sand/cement screed then a liquid applied membrane.

Option F

Application of a Hydrepoxy barrier to the timber followed by a 40mm thick rapid cure screed then a liquid applied membrane.

Option G

Application of a Hydrepoxy barrier to the timber, a self-supporting rapid cure screed, and a sheet rubber membrane and tiles.

Note: Where the rapid cure screed systems are applied over fibre-cement sheeting, the preferred area for this application is shower recesses. Where larger areas are done with multiple sheet joints, some show-through cracking may occur along the line of the joints if the sheets are not properly secured to the subfloor.

The following flow charts give the steps involved in the system applications.

Suggested ARDEX flexible membranes to be applied as the final waterproofing are.

--ARDEX WPM002

--ARDEX WPM155 Rapid Plus

--ARDEX WPM750 “Undertile Butynol”.

TILING

The final step is the application of tiles, and for this, a cement-based adhesive suitable for use with the membrane is required.

The floor must comply with the normal requirements for tiling on timber and be stable and not subject to movements exceeding 1/360 of span of the floor joists. Large format tiles may require tighter tolerances, such as 1/500, to prevent problems such as lipping and cracking.

Where a screed has been placed, suitable adhesives include:

ARDEX ABAFLEX,

ARDEX X18

ARDEX X77

ARDEX X78

ARDEX X56

ARDEX MPP

ARDEX X52

Where no screed is in place, the recommended adhesive is,

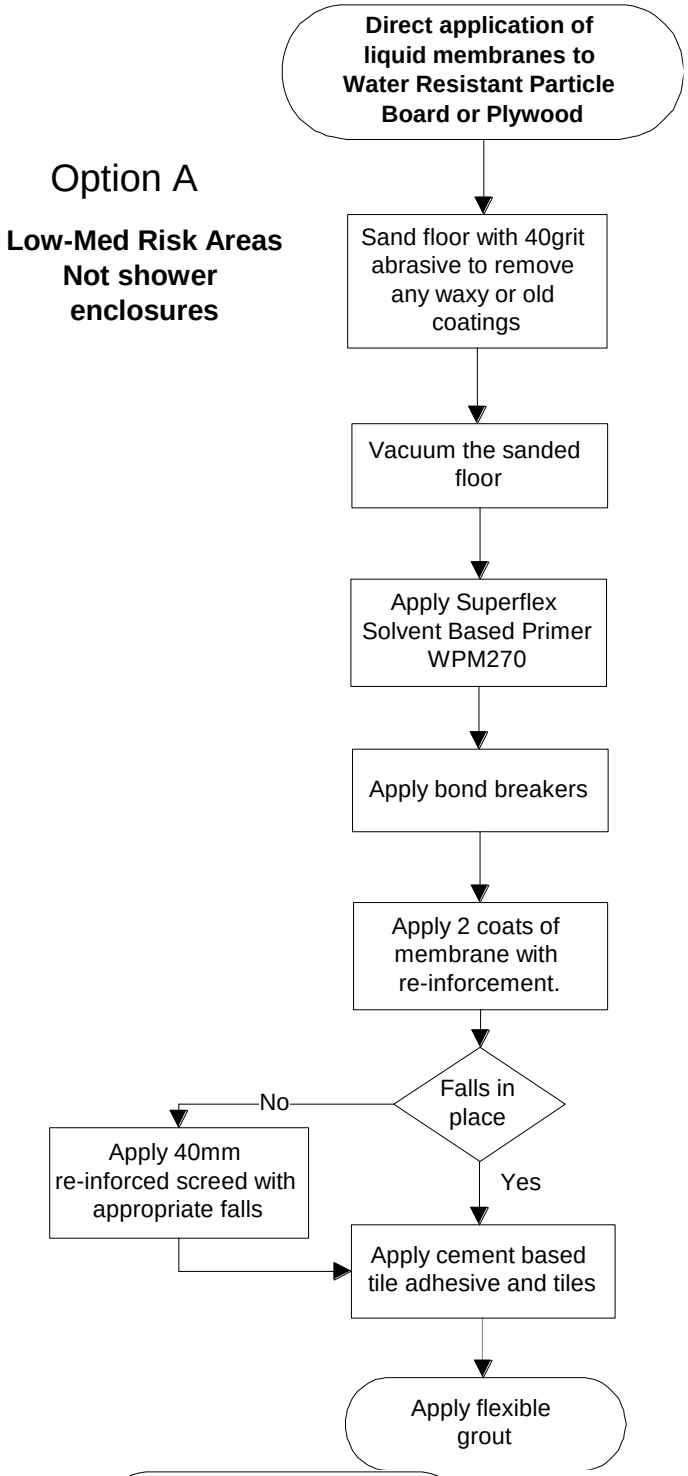
ARDEX X56

Grouts should be flexible, and the recommended grouts are.

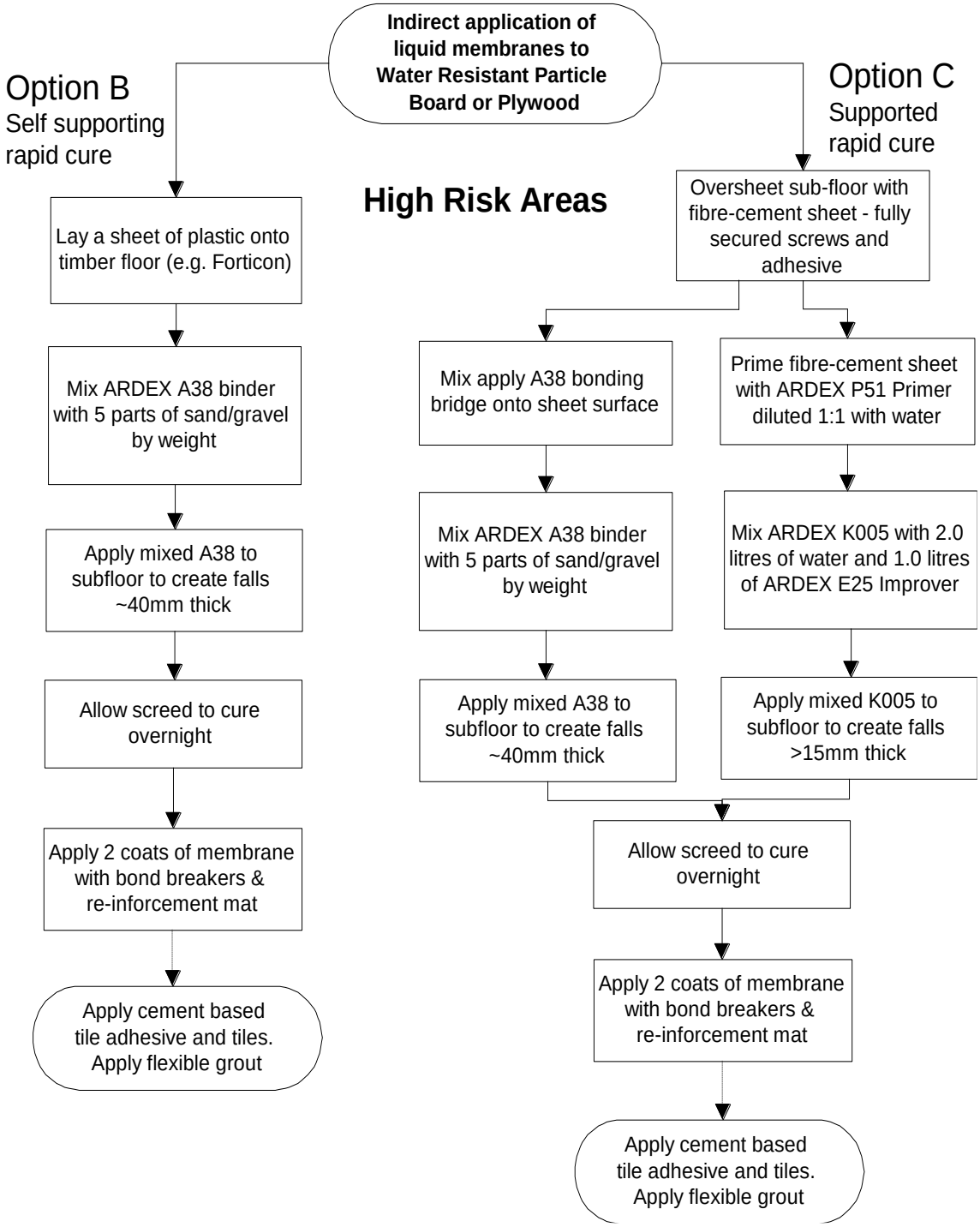
--ARDEX FG-8 GROUT mixed with ARDEX Grout Booster

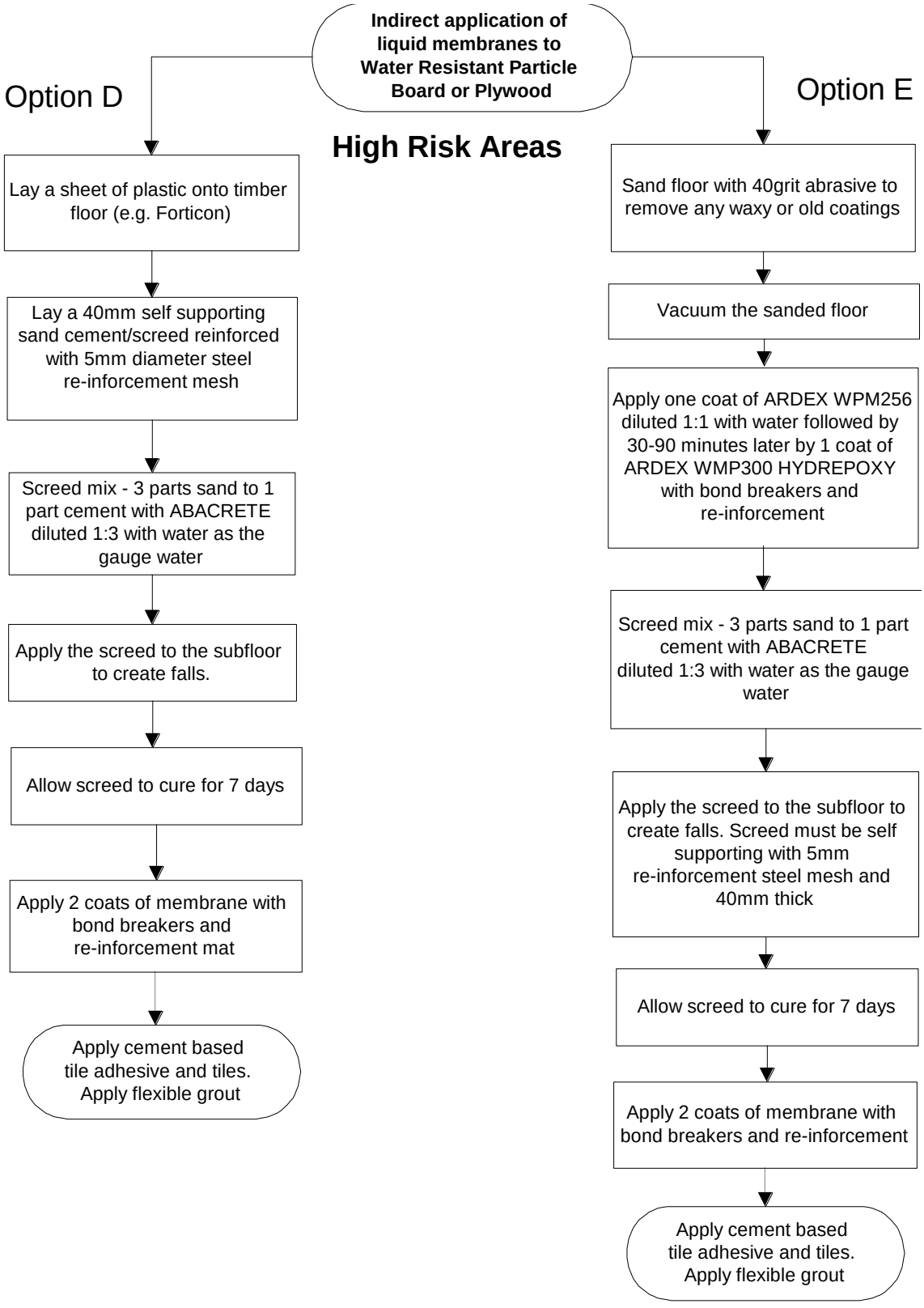
--ARDEX FS-DD mixed with ARDEX Grout Booster

--ARDEX WJ-50 mixed with ARDEX Grout Booster

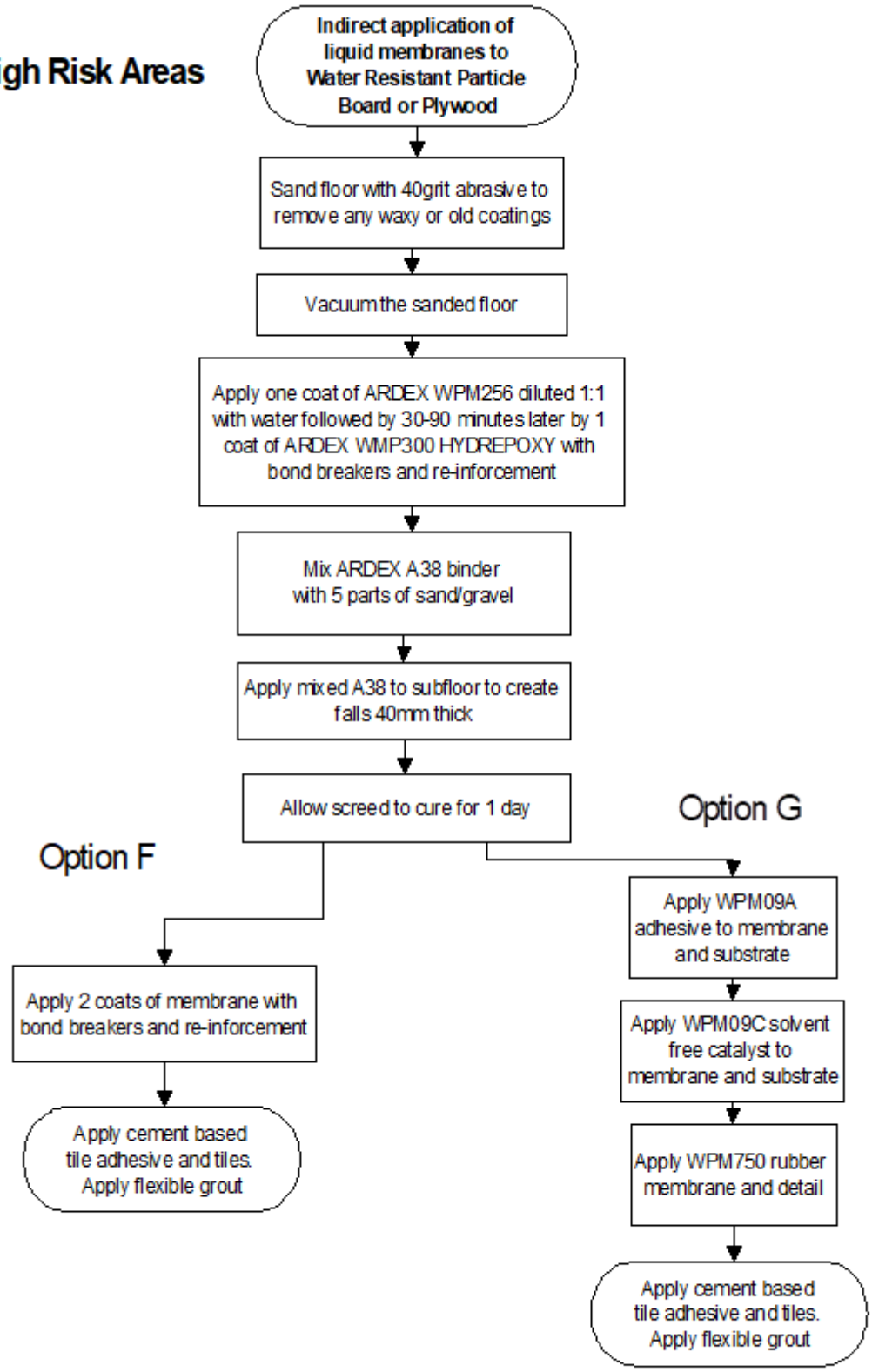


High Risk Areas


Indirect application of liquid membranes to Water Resistant Particle Board or Plywood
Option B
Self supporting rapid cure
Option C
Supported rapid cure
High Risk Areas
Lay a sheet of plastic onto timber floor (e.g. Forticon)
Mix ARDEX A38 binder with 5 parts of sand/gravel by weight
Apply mixed A38 to subfloor to create falls ~40mm thick
Allow screed to cure overnight
Apply 2 coats of membrane with bond breakers & re-inforcement mat
Apply cement based tile adhesive and tiles. Apply flexible grout
Oversheet sub-floor with fibre-cement sheet - fully secured screws and adhesive
Mix apply A38 bonding bridge onto sheet surface
Mix ARDEX A38 binder with 5 parts of sand/gravel by weight
Apply mixed A38 to subfloor to create falls ~40mm thick
Prime fibre-cement sheet with ARDEX P51 Primer diluted 1:1 with water
Mix ARDEX K005 with 2.0 litres of water and 1.0 litres of ARDEX E25 Improver
Apply mixed K005 to subfloor to create falls >15mm thick
Allow screed to cure overnight
Apply 2 coats of membrane with bond breakers & re-inforcement mat
Apply cement based tile adhesive and tiles. Apply flexible grout


Indirect application of liquid membranes to Water Resistant Particle Board or Plywood
High Risk Areas
Option D
Lay a sheet of plastic onto timber floor (e.g. Forticon)
Lay a 40mm self supporting sand cement/screed reinforced with 5mm diameter steel re-inforcement mesh
Screed mix - 3 parts sand to 1 part cement with ABACRETE diluted 1:3 with water as the gauge water
Apply the screed to the subfloor to create falls.
Allow screed to cure for 7 days
Apply 2 coats of membrane with bond breakers and re-inforcement mat
Apply cement based tile adhesive and tiles. Apply flexible grout
Option E
Sand floor with 40grit abrasive to remove any waxy or old coatings
Vacuum the sanded floor
Apply one coat of ARDEX WPM256 diluted 1:1 with water followed by 30-90 minutes later by 1 coat of ARDEX WMP300 HYDREPOXY with bond breakers and re-inforcement
Screed mix - 3 parts sand to 1 part cement with ABACRETE diluted 1:3 with water as the gauge water
Apply the screed to the subfloor to create falls. Screed must be self supporting with 5mm re-inforcement steel mesh and 40mm thick
Allow screed to cure for 7 days
Apply 2 coats of membrane with bond breakers and re-inforcement
Apply cement based tile adhesive and tiles. Apply flexible grout

High Risk Areas



CASE HISTORY

The photograph on the left shows the effects on an area subjected to wetting, which was floored with ordinary particleboard and insufficiently protected with a poorly applied membrane.

As can be seen, the water has penetrated the membrane and migrated through the particleboard. This has resulted in the leaching of solubles from the particleboard and the growth of mould. This floor was damaged sufficiently that replacement of the boards was considered a possibility.

This illustrates the necessity to fully protect timber floors in wet areas and pay careful attention to detailing.

CONCLUSIONS

Waterproof membranes can be applied over internal timber substrates before tiling. However, careful attention to detail is necessary as the long-term stability of timber-based substrates is less than that of masonry or fibre-cement sheets.
The systems described in this bulletin are intended for internal applications, not external timber surfaces such as decks. Special procedures using ARDEX sheet membranes such as BUTYNOL are required in these cases.

Non-resistant plywood or particleboards should not be used in these situations, as any defect in the membranes' application can quickly lead to water penetration and rapid degradation of the substrate, with resultant collateral damage and costs.

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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