TECHNICAL BULLETIN – TB088

TREATMENT OF SWIMMING POOL INTERNALS

(ARDEX WPM002 - 2 PART SYSTEM)

25th June 2026

INTRODUCTION & SCOPE

This Information Sheet is designed to detail the treatments necessary for the surface preparation and application of a waterproof membrane finish to a newly constructed concrete swimming pool prior to the application of a tiled finish.

Several aspects of the construction and coating schedule are covered in each of the following sections.

Application of a coating to a swimming pool is a critical process – please read all information carefully before proceeding. Any inquiries or doubts should be directed to your nearest ARDEX technical representative before carrying out any work.

STRUCTURAL CONSIDERATIONS

This specification incorporates a flexible membrane suitable for pools that are structurally sound and not likely to develop excessive cracks or structural relative movement between the walls and base or other locations over time. The construction of the pool must include continuous reinforcement (for single cast structures) or reinforcing starter bars (for dual cast structures) between the base and the walls in accordance with relevant Australian Standards.

Where the pool is to be over a habitable area, or other critical areas, the waterproof membrane should be fully reinforced, and the optional reinforcement layer should be included.

Suspended pools over habitable areas must be accompanied by a structural engineer's report confirming the structural integrity of the pool.

CLIMATIC CONDITIONS

Major problems can be experienced because of climatic conditions during application of a swimming pool membrane coating.

Concrete pools are extremely effective heat sinks and retain heat or cold for significant periods after the sun moves away or cold conditions commence. The ambient conditions control what happens with external concrete pool shells.

COLD

No membrane coating application should take place while the ambient temperature is below 10°C, or while the temperature is around 10°C and is not expected to rise above 15°C for the subsequent four hours.

No membrane application shall take place when the shell surface temperature is lower than 10°C.

HOT

No membrane coating application should take place while the ambient temperature is equal to or above 35°C and remain at this level for the daytime hours.

No membrane coating application should take place while the surface temperature is equal to or above 35°C. Premature drying will occur.

AMBIENT TEMPERATURE

If the ambient (air) temperature falls below 8°C the drying rate will be severely slowed, and chemical curing will cease altogether. As the temperature rises both drying and chemical curing rates will increase although the chemical curing rate will remain very slow until the temperature reaches 15°C.

SURFACE TEMPERATURE

Surface temperature is the actual temperature of the substrate surface, and this can vary substantially from the ambient temperature. High surface temperatures can result in blistering of the membrane coating and lead to improper bonding with subsequent delamination between coats. Water or moisture in the substrate because of exposure to rain or high-pressure water blast cleaning will commence to vaporise at around 40-45°C. The membrane coating has a very low permeability and therefore will not allow this moisture vapour to escape from the surface. The membrane coating therefore must be set hard and well bonded prior to being subjected to the pressures of the vaporising moisture or the water vapour will simply blow the coating off the surface in the form of blisters.

Surface temperature can also affect the flow and bond strength of the membrane coating. High surface temperatures result in the water at the interface of the surface and the fresh coating evaporating rapidly reducing the flow of the membrane coating and therefore reducing the penetrating properties and bonding ability of the coating.

RELATIVE HUMIDITY

Very high ambient relative humidity will result in the very slow evaporation of water from the membrane coating. Since chemical curing is retarded prior to the membrane coating drying, slow drying and therefore chemical curing will result in conditions of high humidity.

No membrane coating application should take place while the relative humidity is above 90%, or around 90% and not expected to fall below 80% over the subsequent four hours unless the surface temperature is above 25°C.

PENDING RAIN OR SHOWERS

While the ARDEX membrane coating system is very tolerant to early dew, by contrast exposure to early rain or showers before initial cure (<4-5hrs) will result a deterioration, or failure, of the integrity of the membrane. Exposure to rain or showers prior to full curing (within 24 hours of application at a nom., 23 deg.C and 50% RH) may result in membrane coating discolouration which is transient. As the membrane dries out the colour should return to the light dry colour and damage should not occur.

TIME SCALE BETWEEN STAGES

The following are minimum time intervals that should be allowed to elapse between the successive stages as recommended by both AS3958.1-2007, and ARDEX technical information. In each case, the more conservative time span has been selected. They are:

1. Between placement of the pool shell and rendering or screeding: **6 weeks to allow for any plastic shrinkage to develop.**

   Note: Advice on potential plastic shrinkage of concrete pool shells should be obtained from an engineer and the required time span to minimise this problem.

2. Between placement of the pool rendering and application of the waterproof membrane: **16 hours.**
3. Between completion of rendering and fixing of tiles: **21 days (If tiles are directly fixed to the render or concrete).**
4. Between completion waterproofing membrane application and fixing of tiles: **24 hours @ 23°C /50% R.H. (If tiles are directly fixed to waterproof membrane)**
5. Between completion of tile fixing and the commencement of grouting: **7days**.
6. Between completion of the grouting and sealing of expansion joints and the filling of **t**he pool: **3 weeks for cement-based grout systems; 7 days for the epoxy resin systems.**

   Note: The above are minimum time intervals that should be allowed to elapse between the successive stages. Wet weather typically requires longer intervals.

SURFACE PREPARATION

PRIMARY PREPARATION

All concrete protrusions shall be ground to be smooth and level with the primary adjacent surface. Surface irregularities resulting from formwork impressions shall be remedied following surface preparation of the off-form concrete.

1.CAST CONCRETE

This section is likely to refer to the base of the pool.

LIGHT BROOM FINISH

All surfaces shall be finished as a light broom surface finish. All surfaces shall be high pressure water washed, or high-pressure detergent washed as required using a nozzle pressure of not less than 7-10 MPa (1,000-1,500p.s.i.) to remove all dirt, grease, oil or other surface contaminants.

OTHER SURFACE FINISHES

All surfaces shall be wet or dry abrasive blast cleaning. Care should be taken not to excessively expose to concrete aggregate, and a non-metallic aggregate must be used. If abrasive blast cleaning is not possible surfaces shall be cleaned free from any residual form release agent (according to the manufacturer's instructions) or other surface contaminants and all surfaces shall wet down prior to acid etched by applying liberal quantities of a 15% hydrochloric (muriatic) acid solution in water to the surface. Allow the acid to cease reacting and thoroughly rinse with fresh clean water.

Note: Acid etching should only be used as a last resort and particular emphasis shall be placed on the complete removal of all residual acid. The wastewater is normally classified as contaminated waste and must not be washed into drains that exit to the street gutters.

2.OFF-FORM CONCRETE AND CORE FILLED CONCRETE

This section is likely to refer to the walls of the pool. Any residual form release agent shall be removed, and surfaces shall be wet or dry abrasive blast cleaned to achieve a surface profile of 50-75 micrometres and open the pores of the concrete. Care should be taken not to excessively expose to concrete aggregate, and a non-metallic aggregate must be used. Surfaces may then be rendered or prepared for direct coating membrane application.

SECONDARY PREPARATION

DIRECT RENDERING WITH SAND-CEMENT CEMENT OR PREMIXED POWDER

When rendering, it is advisable to use the minimum thickness that is consistent with achieving a smooth and flat surface. It is not desirable to have alternating areas of low thickness and then deep layers, as the shrinkage after cure will be variable across the surface of the rendered shell. However, the larger the size tile used, the flatter the surface needs to be, so there must be compromise between tile size used, and the ability to provide a smooth and stable surface for tiling.

NOTE: These renders are NOT placed over the flexible membrane system, they are under it. Placement of membranes onto the flexible surface of a Class II or III membrane creates the risk of cracking and de-bonding.

METHOD 1 – ARDEX WR120FR

Install ARDEX WR120 render in accordance with the product datasheet. This pre-bagged product must be waterproofed and tiled; it is not suitable to be left as the finished surface. This material is applied direct to the prepared concrete and can be used with ARDEX WR Primer. The minimum thickness is 2mm and nominal maximum of 12mm for hand application.

METHOD 2 – SAND/CEMENT + ADDITIVE

All surface imperfections, such as blow holes, surface damage, areas adjacent to intrusions, etc., should be reinstated to form a smooth even surface finish.

Reinstatement shall be carried out using a mortar formulated from a 3:1 sand cement blend blended with a gauging solution consisting of 4 volumes of water mixed with 1 volume of ARDEX WPM405 Sheltercrete Additive.

Immediately prior to placement of the repair mortar, surfaces should be coated with a slurry coat prepared by blending 4 volumes of Portland cement with a mix of 1 volume of ARDEX WPM405 Sheltercrete Additive and 1 volume of water, as a new to old concrete bonding bridge. The reinstatement mortar should be placed while the bonding bridge remains wet or tacky.

METHOD 3 – SAND/CEMENT + ADDITIVE WITH EPOXY INTERCOAT

A 3:1 sand cement render shall be prepared using a blend of 1 volume of ARDEX WPM405 Sheltercrete Additive and 3 volumes of water as the gauging solution.

Immediately prior to laying the render apply a thin coat of ARDEX HydrEpoxy WPM300 thinned 3:1 with fresh clean water as a new to old concrete bonding bridge. Only apply the HydrEpoxy to an area than can be rendered within the drying time of the bonding bridge.

Lay and finish the render over the bonding bridge only while the bonding bridge remains wet or tacky. If the bonding bridge dries before the render can be laid apply a further coat over the existing coating before continuing. Rendered surfaces shall be finished to a light broom finish.

INTERNAL CORNERS

Install a coving of at least 20mm in all corners. Coving shall be carried out using a mortar and slurry coat formulated as detailed for Method 2 above or with ARDEX WR120. Immediately prior to placement of the cove, surfaces should be coated with the slurry coat as a new to old concrete bonding bridge. The cove should be placed while the slurry coat remains wet or tacky.

PRIME / SEAL COATING

All surfaces shall receive a single coat of ARDEX WPM300 HydrEpoxy, diluted with water at a maximum ratio of 20%. Application may be by brush or roller and the coating should be worked well into the surface. Allow the seal coat to dry to touch (normally approximately 4 hours) and apply to all surfaces a second undiluted prime coat of ARDEX WPM300 HydrEpoxy by brush, roller or spray to achieve a coverage rate of 3 square metres per litre.

Important: In general, and particularly in warm or hot ambient conditions, the Prime/Seal Coating should be applied when the surface temperature is declining (such as late afternoon) to avoid the risks of vapour blistering.

WATERPROOF MEMBRANE APPLICATION

Allow the Prime/Seal coating to dry thoroughly before proceeding.

TREATMENT OF CRACKS AND JOINTS

All joints and minor cracks (above render layer) shall be filled with a sealant specifically designed and recommended by the manufacturer as being suitable for pool installations. Always use a reputable sealant manufacturer and the sealant must be installed strictly in accordance with the manufacturers' recommendations.

More major cracks typically in the pool shell, will require examination and structural repairs and/or RA series epoxy resin injection systems, with or without the Concrete Crack Lock supports before any rendering or further works. Contact ARDEX for more information and potential examination by a repair expert.

EXPANSION JOINTS

All areas to receive ARDEX Construction Detail Bandage must remain dry.

Install temporary masking tape over the expansion joints to define an area of free movement for the bandage of approximately 50mm wide.

Mix ARDEX EG15 (Part A & Part B) in the ratio of 1:2 then add sufficient Portland Cement to the blended ARDEX EG15 components to form an icing sugar consistency. The ARDEX EG15 mix must be used within 15 – 20 minutes.

Lay a bed of ARDEX EG15 onto the concrete surface to the sides of the temporary masking tape. Immediately remove the masking tape and position the ARDEX Construction Detail Bandage with the polypropylene wings into the ARDEX EG15 bed. (No epoxy to be under the 50mm free area of the band).

Embed the wings into the ARDEX EG15 and remove excess from the surface of the band. Whilst still wet sprinkle the wet ARDEX EG15 with 0.5mm dry clean sand and allow to cure for 48Hrs. Protect from adverse weather conditions whilst curing.

Construction Joints & Cold Joints

In applications where the Optional coat incorporating full reinforcement is not employed, all construction and cold joints shall be stripe coated along the joint and to at least 150mm on either side of the joint with a liberal coat of ARDEX WPM002 Two Part.

While the ARDEX WPM002 Two Part remains wet and fluid lay ARDEX Deckweb woven polyester mat reinforcement into the coating and knead into the coating to wet the ARDEX Deckweb through. Ensure the ARDEX Deckweb is fully wetted out and all creases or air pockets are removed.

Care must be taken that each area coated is limited so that the reinforcement can be laid while the coating remains wet or tacky. Immediately following the treatment of all joints, the first coat of membrane can be applied over the remainder of the surface.

Membrane Application

First Coat - After all joints have been treated apply one coat of ARDEX WPM002 Two Part Membrane at a coverage rate of not greater than one (1) square metre per litre (wet film thickness of 1 mm).

Optional coat for pools over habitable or critical areas- Allow the previous coating to dry thoroughly, at least 16 hours, and apply to all surfaces a further coat of ARDEX WPM002 Two Part Membrane to all surfaces at a coverage rate of not greater than 1 square metre per litre (wet film thickness of 1mm). While the ARDEX WPM002 Two Part remains wet and fluid lay ARDEX Deckweb woven polyester mat reinforcement into the coating and knead into the coating to wet the Deckweb through. Ensure the Deckweb is fully wetted out and all creases or air pockets are removed.

Finish Coat

Allow the previous coating(s) to dry thoroughly, particularly over reinforced areas, (at least 16 hours) and apply to all surfaces a further coat of ARDEX WPM002 Two Part at a coverage rate of not greater than 1 square metre per litre (wet film thickness of 1.0 mm).

Allow the membrane to fully dry particularly over reinforcement for a period of not less than 24 hours before proceeding with the tiling.

Tiling Installation

Note: Observe time scale between stages before proceeding. Tile adhesives must comply with the ISO13007 (AS4992.2) rating Types C2S1 or R1 as per AS3958.

Materials for Fixing of Tiles

Suitable ARDEX adhesives for fixing tiles in swimming pools are: -

1. ARDEX X18 adhesive recommended to be used with ARDEX E90 or ARDEX Abalastic for improved performance.
2. ARDEX X68 adhesive recommended to be used with ARDEX E90 for improved performance.

3. ARDEX X77 adhesive recommended to be used with ARDEX E90 for improved performance.
4. ARDEX OPTIMA adhesive
5. ARDEX WA100 Epoxy Adhesive

MATERIALS FOR GROUTING

Suitable ARDEX tile grouts in swimming pools are: -

1. ARDEX EG15 Epoxy Grout
2. ARDEX FG8 grout White plus ARDEX Grout Booster.
3. ARDEX FSDD grout Ultra White plus ARDEX Grout Booster.
4. ARDEX WJ50 grout colours 514 and 501 plus ARDEX Grout Booster

INSTALLING TILES BY THIN SET METHOD

Substrate must be solid, compact, and free from loose particles, grease, wax, oil, form release agents and other bond breakers. Where the adhesive is applied over a membrane primers are not required to be used with the adhesives.

1. **ARDEX OPTIMA -** Mix in strict accordance with the Product Data Sheet.
2. **ARDEX X77 -** Mix in strict accordance with the Product Data Sheet. Where increased performance to S2 classification, or resistance to saltwater pools is required, ARDEX E90 is added to the gauge water. For 15kg of ARDEX X77 powder, mix 2.5 litres (~2.5kg) of ARDEX E90 with up to 5.5L of clean water then mix with a mechanical stirrer to a smooth paste.
3. **ARDEX X18 -** Mix in strict accordance with the Product Data Sheet. Where increased performance to S2 classification, or resistance to SALTWATER pools is required, ARDEX E90 or ARDEX Abalastic is added to the gauge water. For 20kg of ARDEX X18 powder, mix 2 litres (~2kg) of ARDEX E90 with up to 4.5L of clean water, or 6 litres of neat ARDEX Abalastic then mix with a mechanical stirrer to a smooth paste.
4. **ARDEX X68 -** Mix in strict accordance with the Product Data Sheet. Where increased performance or resistance to saltwater pools is required, ARDEX E90 is added to the gauge water. For 11kg of ARDEX X68 powder, mix 2 litres (~2kg) of ARDEX E90 with 4L of clean water.
5. **ARDEX WA100 EPOXY -** Mix in strict accordance with the Product Data Sheet. Do not spot fix tiles in swimming pools, only use full adhesive coverage.

Apply the selected adhesive with a notched trowel to achieve 100% bed coverage and a dry bed thickness of not less than 2-3 mm. Back buttering of tiles may be required when the tile is deeply keyed or for placement on curved surfaces to gain the required back coverage with consequent increase in thickness. Tile adhesives MUST not be used as fillers or renders as they shrink on curing leading to de-bonding or tile cracking.

Careful checks must be made to ensure that a skin does not form on the adhesive surface. Should a skin form on the adhesive do not wet spread the adhesive and do not add water to the mix.

Allow the adhesive to air cure for a minimum of **7 days*** before proceeding with Grouting. Note: Refer to ARDEX Technical Paper TP002 for information about mesh backed mosaics in swimming pools. “Stack stone” tiles are not recommended for swimming pool installation. The placement of pool coping tiles is discussed in more detail in ARDEX Technical Bulletin TB198. The primary issue relates to the pool shell-ring beam junction which shall not be tiled across by direct fixing across the joint.

GROUTING

1. **EG15 EPOXY GROUT -** Grout all tiles working the grout well into the voids between the tiles over an area of approximately one (1) square metre. Before proceeding remove all excess grout from the area treated. Ensure all tile surfaces are cleaned free from all residual grout within 1-2 hours of mixing, or it will be very difficult to remove. Allow the grout to air cure for a minimum **7 days** for ARDEX EG15 prior to commencement of filling the Pool.

2. **FG8 GROUT WITH GROUT BOOSTER -** Mix 4 volumes of ARDEX Grout Booster with 1 volume of fresh clean water and blend with the ARDEX FG8 grout to achieve a firm, smooth medium slump paste.

   Dampen joints, especially in hot weather or with porous tiles and fill joints using a rubber squeegee. Wipe off excess material taking care not to remove excessive material from the joints. Allow to touch dry and polish with a clean lint free cloth to remove residual scum.

3. **FSDD GROUT WITH GROUT BOOSTER -** Mix 4 volumes of ARDEX Grout Booster with 1 volume of fresh clean water and blend with the ARDEX FSDD grout to achieve a firm, smooth medium slump paste.

   Dampen joints, especially in hot weather or with porous tiles and fill joints using a rubber squeegee. Wipe off excess material taking care not to remove excessive material from the joints. Allow to touch dry and polish with a clean lint free cloth to remove residual scum.

   Allow 21 days* prior to filling the pool with water. (FG8 and FSDD)

   ***Important Note**. The recommended waiting times before grouting after tiling is completed, and filling the pool after grouting is completed, are based on the nominated intervals in AS3958. They are intended for C class materials in general, however R class materials do cure more rapidly than C class materials. ARDEX has not conducted any specific examination of the difference in cure times vs performance in pool water, and hence follows the overall recommendations in AS3958 for both C and R class materials.

   Installers who reduce these waiting times to expedite the completion of the pool do so at their own risk.

NOTE: Grout for non-standard pool treatments

In pools that contain Magnesium and other elements (refer to TB143 - Pool Water Chemistry, where conditions are chemically aggressive, we recommend replacing traditional cementitious C-class grouts with ARDEX EG15, R-class grout to ensure long-term durability and resistance to chemical attack.

If the epoxy grout is not installed correctly and water is able to reach the cementitious tile adhesive, Magnesium and other elements may, over time, cause deterioration. Where this is a concern, ARDEX WA100 can be used as the tile adhesive, followed by ARDEX EG15 grout.

MOVEMENT JOINTS

Existing expansion or construction joints in substrate must be carried through the tile work to the face and shall conform to architectural details and Australian Standard 3958.1-2007.

Expansion joints shall be installed where tile work abuts restraining structures such as perimeter walls, curbs, corners and where there are “changes of plane”

Installation shall have movement joints in a grid pattern spaced at a maximum of 5.0 x 6.0m, the 5.0m lining up with every second lane marker is an ideal set out. Movement joints shall be raked or cut through the setting bed to the supporting slab structure.

Expansion joints and movement joints shall be sealed with a sealant specifically designed and recommended by the manufacturer as being suitable for pool installations. Always use a reputable sealant manufacturer and the sealant must be installed strictly in accordance with the manufacturers’ recommendations.

ARDEX recommends the use of ARDEX ST neutral cure silicone.

The responsibility for calculating the actual spacing and size of the expansion joints shall be the responsibility of the tiling contractor or structural engineer employed by the same company, or the contractor shall be responsible for the site measurement and placement within the design tolerance described in the plans and specifications.

Always use a reputable sealant manufacturer and a sealant specifically designed and recommended by the manufacturer as being suitable for pool installations. The sealant must be installed strictly in accordance with the manufacturers' recommendations.

PROTECTION

The Tiling Contractor shall take all precautions to protect the finished tile work from damage by other trades. Do not allow traffic on fresh tile work and fresh grout joints for at least 8 hours. Tile work must not be washed or exposed to rain and must be protected from direct sun, drying wind for at least 24 hours after installation. The tile work shall be allowed to air dry for the nominated period after grouting and prior to filling the pool.

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
Typo correction

DOCUMENT REVIEW REQUIRED
24 months or whenever third-party suppliers change their recommendations.

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