

1. INTRODUCTION

1.1 General Information:

Insuwrap waterproofing membranes are used for lining of swimming pools. **Insuwrap Liners** are suitable for private and public indoor and outdoor pools.

Insuwrap waterproofing membranes have long proven track records. They have been extensively used for new projects, as well as renovation of existing pools all over the world.

More advantages are fast installation and immediate usage after installation.

Insuwrap waterproofing membranes are economical, have high physical & chemical properties & have an excellent appearance.

1.2 Limitations:

Insuwrap waterproofing membranes are laid loose on smooth substrates and geotextile layer and fixed along perimeter edges covering the entire wet area inside a swimming pool. This prevents leakage from the pool caused by structural cracks and monument such as settlement etc.

The pool structure should be of watertight construction, such as reinforced concrete or brickwork.

Installations should only be undertaken by **Insuwrap Certified Applicators**.

This system is not recommended for pools with permanent water temperature above +35°C, or pools with artificial wave making machinery.

... Page 1 of 10

This data is intended to be used by **Insuwrap** approved applicators only and not to be reproduced or used for any other purposes without prior approval from **Insuwrap**.

1.3 Construction Requirements:

The structure should be designed and built to water retaining structure standards and to minimize movement due to structural settlement, temperature changes and shrinkage etc.

The concrete cover to the reinforcement bars should be at least 20mm.

All elements protruding the pool structure and cast in concrete, i.e. service pipes, ladders, underwater illumination equipment, etc. should be made of non-corroding metal or plastics, suitable and approved as swimming pool equipment. The elements should be constructed with flange system in order to allow watertight sealing of the **Insuwrap waterproofing membranes** around them.

It is recommended that an outlet should be fitted to the lowest point in bottom of the pool in order to drain away any potential condensation water under the installed waterproofing membrane. This outlet can also be used to check the water tightness of the installed membrane.

The surface of all substances must be smooth to prevent the waterproofing membrane being punctured.

1.4 Waterproofing System:

The work is simple and quick to complete by Approved Certified Applicators.

The leaks can be checked immediately and the pool can be put into use immediately after installation (no waiting times due to curing etc.)

Insuwrap PVC coated metal strips & angles are used at all corners, edges and terminations to mechanically fix the liner with no gluing to the substrate.

Indoor pools, integrated in structures often include adjacent service rooms. The deck structure of which is often the floor poolside. **Insuwrap Pool Lining** can be continued with loose laid membrane under the poolside finish, in order to prevent the penetrations of water into the service rooms.

... Page 2 of 10

This data is intended to be used by **Insuwrap** approved applicators only and not to be reproduced or used for any other purposes without prior approval from **Insuwrap**.

1.5 Installations

1.6 General Information before Installation:

- Installation of **Insuwrap Pool Lining** should only be performed by **Insuwrap Certified Applicators**.
- Installation works in outdoor pools should be performed in dry weather conditions and the ambient temperature shall be at least +5°C.
- Membrane rolls, should be stored in a horizontal position in a dry place and protected against exposure and weathering on site.
- Waterproofing contractors should wear shoes with rubber soles, when walking on installed membranes. Smoking and open flames should not be permitted on the site.
- In order to prevent damage of installed waterproofing membrane the waterproofing works should be performed on the walls prior to the works on the bottom of the pool.

2. Substrate Preparation:

2.1 New Works:

- The surface of concrete substrates should be smooth.
- Curved edges and corners should be mechanically chamfered.
- Any ridges in the concrete substrate (i.e. from formwork) should be ground away, and the area should then be made smooth.
- Any protruding nails and wires should be removed.
- Honeycombing should be broken out and then filled using suitable repair mortar.

... Page 3 of 10

This data is intended to be used by **Insuwrap** approved applicators only and not to be reproduced or used for any other purposes without prior approval from **Insuwrap**.

- Any cracks in the structure should be sealed by resin injection. The pool structure should be sealed against external water penetration.
- Block and brickwork walls should be rendered with sand and cement mortar at thickness of min. 20mm. Uneven concrete substrates on the base of a sand and cement screeding.
- Note: Aggregates should not exceed 4mm. Mortars and screeds should be finished by steel trowel.
- Protruding elements, i.e. pipes, fittings, rods etc., should be cleaned by grinding or other suitable mechanical means.
- Prior membrane installation, the entire surface should be cleaned and rinsed thoroughly with clean water. Any ponding water should be removed.
- After drying, the entire substrate should be disinfected by application of a purpose made proprietary chlorine bleach solution.

2.2 Existing Structures (Pool Renovation):

- Old linings and hollow rendering or screeds should be thoroughly removed.
- Then continue with substrate preparation making good and cleaning as outlined in "A) New Works".
- All plumbing and electrical systems should be checked by qualified people to ensure compliance with standards.

2.3 Intermediate Geotextile Layer

The geotextile should be of polypropylene non woven fabric, needle punched or thermally cured (chemically cured geotextiles are not compatible with membranes and should therefore not be used).

The geotextile should have min. weight of 200 g/m² on smooth concrete substrates. On variable or rendered substrates a minimum weight of 300 g/m² is preferred.

... Page 4 of 10

This data is intended to be used by **Insuwrap** approved applicators only and not to be reproduced or used for any other purposes without prior approval from **Insuwrap**.

After installation, all geotextiles should be disinfected. The geotextiles should be fixed temporary at walls (i.e. with self adhesive tapes) except when held by membrane restraint fixing metal work. The base should be loose laid and temporary by ballasted (i.e. with sandbags).

In order to prevent visibility of the geotextile it should be butt jointed to achieve a smooth appearance.

2.4 Overall Membrane Installation

For efficiency and cleanliness, the installation should be in the following sequence:

1. Install **Insuwrap PVC laminated metalwork** performed to suit the pool design. Attach and install geotextile at the same time starting at top of the walls.

Note: Intermediate fixings must be used on vertical edges and corners in excess of 4m.

2. Prepare waterproofing details at penetrations in walls (pipes etc.)
3. Mount support sheet metal over openings of expansion joints in walls.
4. Install **Insuwrap Pool Lining membranes** as vertical waterproofing, including terminations and penetration details.
5. Waterproofing to base: Install **Insuwrap PVC laminated metalwork**.
6. Prepare waterproofing details at penetrations in bottom slabs. (i.e. low level outlets).
7. Mount support sheet metal over openings of expansion joints.
8. Install **Insuwrap Pool Lining membranes** as horizontal waterproofing, including attachment at wall base edge fixings and penetrations details.
9. Check and approve all welded seams for water tightness.
10. Install **Insuwrap Pool Lining membranes** and marking strips, where required.
11. Check completed waterproofing for its water tightness, then clean and disinfect membrane surface prior to filling.

... Page 5 of 10

This data is intended to be used by **Insuwrap** approved applicators only and not to be reproduced or used for any other purposes without prior approval from **Insuwrap**.

Waterproofing Termination Details:

- Install the performed **Insuwrap PVC laminated metal**, under laid with disinfected geotextile, with mounting hole Ø5mm. spaced max.150mm.
- The metal profiles should be butt jointed with a gap of 5mm.
- The profiles should be fixed with stainless steel, or corrosion protected screw-anchors, Ø >4.5mm, length >30mm into prepared holes (remove drillings with vacuum).
- All cut edges of PVC laminated metal profiles should be protected with **Insuwrap** liquid PVC against corrosion.
- Each butt joint should be covered with self-adhesive tape (width 20mm).
- Cut straps of **Insuwrap waterproofing membrane** and weld over butt joints of mounted metal profiles.
- Clean the surface of mounted elements.
- Where required, apply sealant at upper or outer edge of metal element (application instructions of sealant must be followed).
- Make sure to leave small openings (approx. 3 – 5mm, spaced approx. 5m) in sealant, in order to release entrapped air behind the installed membrane, when the pool is filled with water.

2.5 Attachment at Perimeters, Corners and Edges

2.5.1 Vertical Corners / Edges:

- All edges and corners require angle performed **Insuwrap PVC Laminated Metal** cut and folded to suit.
- Proceed with **Insuwrap** metal work and geotextile fixing followed by **Insuwrap** membrane installation as outlined in section 3.5 Waterproofing termination details above.

2.5.2 Intermediate fixings at walls:

Intermediate fixings with strips of **Insuwrap** PVC laminated metals are required, where wall heights exceeds 4.00m. The linear fixings should be mounted at every 2.00m level

... Page 6 of 10

This data is intended to be used by **Insuwrap** approved applicators only and not to be reproduced or used for any other purposes without prior approval from **Insuwrap**.

2.5.3 Perimeters on bottom / bases:

Any concave and/or convex corners require angle performed **Insuwrap** PVC laminated metals, cut and folded to suit.

2.6 Waterproofing Details

2.6.1 Penetrations:

Special care is required in connecting Elements Which Penetrates The Waterproofing Membrane. To connect the waterproofing sheet with fittings, it should be compressed between a loose and an integral flange.

To ensure water tightness at penetrations (i.e. inlet/outlet pipes, skimmers, lights, holding rods, low level outlets, following detail works should be performed:

- Elements should be made of suitable metal or plastic for use in swimming pools.
- All surfaces must be clean and free of oils and grease etc.
- Prepare square-shaped sheet of reinforced **Insuwrap** waterproofing membrane (width and length exceeding outer flange diameter min. 100mm.
- Cut hole diameter according to pipe interior diameter.
- Create two rings of **Insuwrap** waterproofing membrane (exterior diameter complies to outer flange diameter, interior diameter complies to pipe interior diameter.
- Reconcile the prepared sheets in such way, that interior holes are exactly aligned and the **Insuwrap** waterproofing membrane lays between the rings.
- Fix these three layers of membrane spotwise by welding.
- Locate exactly penetration points of fixing bolts and mark with marking pen.
- Cut holes with punch knife (diameter complies exactly with bolt dia.)
- Mount prepared membrane element on integral flange element.
- Mount carefully the loose flange element, make sure that membrane elements have no folds between flanges and span with bolts / screws.
- Weld protruding membrane lap to the surrounding area of waterproof membrane.

... Page 7 of 10

This data is intended to be used by **Insuwrap** approved applicators only and not to be reproduced or used for any other purposes without prior approval from **Insuwrap**.

2.6.2 Expansion Joints:

Expansion joints in slabs and walls should be covered with metal sheet prior to membrane installation, in order to prevent looping of the membrane into joint under hydrostatic pressure. The metal sheet should be fixed at one side of the joint only.

- The cover sheet can be made of stainless steel, or **Insuwrap** PVC laminated sheet, width 200mm, with mounting holes Ø5mm, spread max. 150mm.
- The metal sheets should be butt jointed with a gap of 5mm.
- The elements should be fixed with stainless steel screw-anchors, Ø>4.5mm, length>30mm into prepared bore holes (remove drillings with vacuum).
- Each butt joint should be covered with self-adhesive tape (width 20mm).
- Complete loose layout of geotextile and **Insuwrap** waterproofing membrane over joint covering.

2.6.3 Lane Marker Strips:

Dimensions and layout of lane markers must generally comply with FINA (International rules for swimming competition), or should be installed according to the client's request.

- Mark positions of lane markers with chalk liner on installed membrane.
- Layout and position the lane marker strips. Lane marker strips must be fully welded onto the installed **Insuwrap** waterproofing membrane. Seam edges of lane markers shall be sealed with Liquid PVC.

2.7 Installation Insuwrap waterproofing membranes

2.7.1 Vertical Waterproofing:

- Check surfaces of geotextiles and fixed metal profiles for loose debris and sharp projections prior to membrane installation.
- Membranes should generally be installed vertically on walls. If the wall height does not exceed the roll width, the membrane may be installed horizontally along the walls.

... Page 8 of 10

This data is intended to be used by **Insuwrap** approved applicators only and not to be reproduced or used for any other purposes without prior approval from **Insuwrap**.

● Installation Procedure:

1. Cut the membranes to the approx. size needed. (consider min. 50mm membrane overlaps).
2. Lay wooden batten (thickness 20-30mm) under unfixed prefab. PVC laminated metal angle at bottom-wall intersection.
3. Weld the membrane to the fixed PVC laminated metal of waterproofing termination at the top of the wall.
4. Weld the membrane to the vertical part of unfixed PVC laminated metal angle on bottom.
5. Remove underlaid wooden batten and lay on horizontal part.
6. Step on wooden batten and press PVC laminated metal angle firmly at wall and bottom. Fix the metal angle into bottom with stainless steel, or corrosion protected screws into the predrilled vacuumed holes.
7. Repeat 1 – 6 with next membrane sheet

Notes:

- This operational sequences ensures that the membrane is installed and pre-stretched in order to fit closely and neat by the wall and wall floor junction.
- Vertical overlaps should always be welded from bottom to top.
- Membranes over expansion joints with fixed metal covers should be loose laid.
- Finally weld the installed membrane at the prepared details (i.e. penetrations, etc).

2.7.2 Horizontal waterproofing:

- Check surfaces of geotextiles and fixed metal profiles for loose debris and sharp projections, prior to membrane installation.
- The shape of the pool needs consideration for the membrane laying direction on bottom (i.e. most optimized regarding cut loss and membrane consumption).

... Page 9 of 10

This data is intended to be used by **Insuwrap** approved applicators only and not to be reproduced or used for any other purposes without prior approval from **Insuwrap**.

- **Installation Procedure:**

1. Cut the membranes to the approx. size needed. (Consider min. 50mm membrane overlaps).
2. Unroll and positioning the sheets in 2-3 m steps and pull the roll tight, in order to secure even membrane surface. Starting from the lowest point of the pool working upwards. This prevents settlement of particles at the edge of welded seams as the accumulation of dirt could become visible.
3. Apply temporary ballast on the positioned membrane (i.e. sand bags).
4. Weld the membrane to the horizontal part of the fixed PVC laminated metal profiles at walls
5. Repeat 1-4 with next sheet.
6. Weld o membrane overlaps from the lowest point.
7. Membranes over expansion joints with fixed metal covers shall be loose laid.
8. Finally weld the installed membrane at the prepared details (i.e. penetrations, etc).

3. Cleaning and Maintenance

1. Once tools and all other "foreign items" have been cleared out of the pool, the waterproofing membrane should be subjected to an initial cleaning by clear water spray. This initial cleaning is followed by treatment for disinfecting.
2. The pool filling procedure should be done as soon as possible after the cleaning and disinfecting procedure.
3. Once the pool lining is completed and approved, the commissioning and maintenance is in the responsibility of the swimming pool owner.
4. In order to prevent stains, discoloration or mechanical damage to the membrane, it is essential, that the owner should be informed by the membrane installer about correct commissioning and maintenance.

... Page 10 of 10

This data is intended to be used by **Insuwrap** approved applicators only and not to be reproduced or used for any other purposes without prior approval from **Insuwrap**.