



## Triton Titanbond and Triton Titan Tech Installation Guide

**Triton Titanbond** is a pre-applied, fully bonded waterproofing membrane using a heavy duty virgin polypropylene geotextile. The geotextile is laminated to the membrane to provide a dual function; protecting the membrane from damage and providing an integrated 'bond' to poured concrete, ensuring a fully bonded waterproofing barrier which has exceptionally high resistance to ground gas and VOCs.

**Triton Titanbond** is used for the gas/waterproofing/tanking of underground structures where harmful ground gasses are anticipated.

Standard Dimensions, Material Roll Size Roll & Weight:

**Triton Titanbond** 1.9m x 25m / 47.5 m<sup>2</sup> / roll 36kg

**Triton Titan Tank** 0.9m x 20m / 18 m<sup>2</sup> / roll 22kg

### Installation guidance

Installation guidance is provided for information only and should be read in conjunction with standard details. Site specific detailing and installation methodology should be considered on a case by case basis.

Available System Components and Accessories:

**Triton Titanbond Edge Strip** – 1m wide strip of **Triton Titanbond** for use on corners and kicker details to facilitate the transition from horizontal to vertical application. Used in conjunction with the corner units.

- **Triton Titanbond Ext Tape** – 300mm wide self-adhesive strip of **Triton Titan Tank** for use on roll end joints and for detailing around penetrations and perforations in the **Triton Titanbond** (can also be used as a repair patch).
- **Triton Titanbond Roll Edge Sealing.**
- **Triton Protection Fleece** – 1.9m and 2m wide protection geotextiles for use with **Triton Titan Tech** system.
- **Triton Hydrolock Paste** – Water resistant bentonite grout, for use around penetrations and perforations in the **Triton Titan** system.
- **Triton TT Waterstop** – 25mm x 20mm x 3000mm hydrophilic water bar, for use in concrete construction joints to restrict the passage of water.

### General precautions:

It is recommended that barrier systems are installed in ambient air temperatures in excess of -5°C. Ingress of water into the installation area should be prohibited. In all cases the surface onto which the barrier is to be laid or applied should be dry, clean and free from debris or detritus material which may cause damage to the barrier. In all cases it is recommended the installation of barrier geomembranes is completed by a suitably qualified and accredited installer (NVQ level 2). Triton UK can offer advice as to suitable/recommended installers. Appropriate PPE should always be worn during handling, placement and fixing of the barrier. Vehicular traffic directly on top of the barrier should be avoided. Foot traffic directly on top of the barrier should be restricted. Where either vehicular or foot traffic is unavoidable, additional protective measures may be required to prevent damage to the barrier. (Use of protection fleece and/or protection boards).

Smoking and naked flames are strictly prohibited.

### Substrate preparation:

Substrates for installation of the **Triton Titanbond** and **Triton Titan Tank** membrane system need to have sufficient stability to avoid movement during the installation and subsequent construction works, including the concreting. The substrate preparation should include the following:

A clean, dry, uniform, smooth surface free from debris and detritus, ponding water (damp or slightly wet is acceptable), oil and grease. Voids (> 12mm depth or width) must be filled before the installation of the **Triton Titan Tech** system. Voids can be filled with suitable sub-grade fill material, or repair mortar of the vertical walls. Where the substrate contains changes in elevation of >12mm, or particle protrusions from the substrate exceed 12mm, a protection fleece should be utilised to protect the membrane from damage from the substrate. Consult Triton System's technical team for advice as to the most appropriate grade of protection fleece.

**General installation procedure Triton Titanbond:**

Installation works should begin at the perimeter detail (edges), followed by the floor (horizontal) and then the wall (vertical) application.

Installation works should only begin on a suitably prepared subgrade/subsurface. Note – defects in the membrane are most commonly caused by subgrade/subsurface penetrations owing to insufficient surface preparation.

Install the **Triton Titanbond** pre-fabricated internal and external corner units to all corners; then Install the **Triton Titanbond Edge Strip** to the perimeter edges and connections on the walls and upstands and joint the corner units to the edge strip.

Lay out the **Triton Titanbond** membrane sheets in the floor area, overlapping to cover the 100mm selvedge on all rolls (horizontal) and joint the sheets together with either **Triton Titan Tape** (roll edge) or **Triton Titan Ext Tape** (roll end) or with welded joints as required.

Form all of the necessary details to the floor area (horizontal), such as pipe penetrations, connections, sumps or lift pits, pile caps, expansion joints and any others that are required using the appropriate accessory items.

Hang the **Triton Titanbond** membrane sheets to the wall area (vertical) overlapping to cover the 100mm selvedge on all rolls and joint the sheets together with either **Triton Titan Tape** (roll edge) or **Triton Titan Ext Tape** (roll end) or with welded joints as required. Note – fixing for vertical application should be restricted above the top of the formwork or to the selvedge. Mechanical fixing should never occur through the geotextile covered area of the **Triton Titanbond**.

Form all of the necessary details to the wall area (vertical), such as pipe penetrations, connections, sumps or lift pits, pile caps, expansion joints and any others that are required using the appropriate accessory items.

For applications with a ground gas protection requirement, periodic validation and inspection of the install should occur in accordance with C735.

For waterproofing applications only – upon completion of the install, check all joints, seams and sheet area for signs of damage/defect/tears and repair as necessary.

If using a double formwork, and the **Triton Titanbond** is to be backfilled against on the outside – ensure protection is in place before backfilling.

**General installation procedure Triton Titan Tank:**

Installation works should only begin on a suitably prepared subgrade/subsurface. Note – defects in the membrane are most commonly caused by subgrade/subsurface penetrations owing to insufficient surface preparation.

All corners should be smoothed and rounded to reduce point loading and stress on the membrane. Internal corners can be 'filleted' using Hyrdolock Paste, or CAB or with a suitable mortar prior to application.

All surfaces to receive the **Triton Titan Tank** shall be primed using **Triton Primer** to aid adhesion to the surface.

Install the **Triton Titan Tank** vertically in 0.9m wide panels (roll width) ensuring a minimum 50mm overlap to each adjacent panel, and joint and seal the overlap with firm pressure by silicone roller – or welded joint overlap in aggressive ground conditions.

Form all of the necessary details to the wall area (vertical), such as pipe penetrations, connections, sumps or lift pits, pile caps, expansion joints and any others that are required using the appropriate accessory items.

For applications with a ground gas protection requirement, periodic validation and inspection of the install should occur in accordance with C735. For waterproofing applications only – upon completion of the install, check all joints, seams and sheet area for signs of damage/defect/tears and repair as necessary.

Ensure protection is in place before backfilling.

**Jointing and sealing using welding:**

For applications with elevated VOC/Hydrocarbon concentrations, welded joints are necessary to provide an effective seal.

For applications with elevated Methane and Carbon Dioxide concentrations, welded joints are recommended to provide the most effective seal. For applications as a waterproofing and Radon barrier only, welded joints are recommended to provide the most effective seal; taped joints are acceptable. Before welding work is carried out trials must be completed to determine the operating window for the welding equipment and materials. It is noted that ambient air temperature, power supply and the condition of welding equipment can affect the working window. Welding window for **Triton Titan Tech** gas barriers is 180-240 oC at a suggested rate of 1.5mm/min on low air flow. Triton Systems recommends that any heat welding is carried out by a Construction Skills NVQ Level 2 qualified installer (or equivalent). A minimum welded overlap joint of 50mm wide should be achieved – it should be noted that the suitability of the welded joint is defined by the joint integrity, as tested in accordance with C735 (most commonly air lance – ASTM D443708:2013), if a welded joint passes integrity testing, it would be deemed acceptable.

**Jointing and sealing using tapes:**

A 100mm overlap selvedge is provided on all rolls of **Triton Titanbond** and **Triton Titanbond Edge Strip**. A 50mm overlap (minimum) is recommended on all rolls of **Triton Titan Tank**. **Triton Titan Tape** (100mm wide) should be utilised for all taped **Triton Titanbond** overlap joints where welding is not required. To joint using tapes, ensure the first panel of barrier is laid, and the surface of the selvedge is clean, dry, and free from dust. Begin by peeling one side of the protective coating from the tape, applying the tape along the outside edge of the selvedge; such that the tape is applied across the full width of the selvedge. Unroll the second layer of barrier ensuring a full selvedge overlap, slowly removing the upper layer of protective film from the tape, and pressing firmly on the taped joint with a silicone roller to remove trapped air.

**Note** – taped joints have the highest failure rate when tested in accordance with C735 to ASTM D4437-08:2013 – therefore it is imperative that pressure sealing with silicone roller is implemented.

**Repairing punctures:**

Should tears or punctures occur in the membrane, these can be patched using a piece of **Triton Titanbond Ext Tape** sized to overlap at least 100mm beyond the extent of the puncture/tear, the patch being applied with firm pressure from a silicone roller. Preferably, repairs should be completed with a heat welded patch of membrane (100mm oversized – membrane to membrane contact) to provide an optimal seal.

**Pile head/rebar penetrations:**

Sealing around pile heads and concrete reinforcement is achieved by application of **Triton Liquid Barrier**, or a layer of **Triton Titanbond Ext Tape**. Apply the **Triton Liquid Barrier** sealant thoroughly to the penetration areas, to achieve a coated thickness of at least 1.00mm (two coats). **Triton Titanbond Ext Tape** should be applied to ensure 150mm overlap onto the penetration and 150mm onto the **Triton Titanbond**. In certain cases, a coating of Pile Head Sealer (PHS) may be required to provide a monolithic bond to the concrete pile.

**Standard details**

Standard installation details are available from Triton Systems directly. Be advised that standard details are not always relevant or applicable to bespoke site specific conditions. We would recommend consulting with Triton Systems or an appropriately qualified installer with regards to site specific detailing.

**Triton Contact Details:**

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