Wykamol ECO SUSTAINABLE WATERPROOFING & PRESERVATION

TRITON

TT ADMIX BEST PRACTICE

NETWORK · RIBA · CPD · PROVIDERS

PCA Property Care ASSOCIATION

NBS

CONSTRUCT CONCRETE STRUCTURES GROUP MEMBER

Basement Waterproofing ASSOCIATION

DUAL ACTION · GAS AND WATERPROOFING

ASUC

TT ADMIX

TT Admix is a powdered waterproofing admixture which actively remains integral to the concrete

A waterproof admixture is defined as an integral waterproof Type B system in accordance with BS8102:2022. **TT Admix** is a powdered waterproofing admixture which actively remains integral to the concrete and is added when the concrete is batched at the ready-mix concrete suppliers' plant.

TT Admix is a permanently active crystalline admixture which waterproofs the concrete, reducing permeability and improving durability. The addition of **TT Admix** does not cause concrete to crack.

Concrete containing **TT Admix** is supplied to site and installed by the ground worker in accordance with good concreting practice. It is delivered straight from the RMC supplier pre-mixed, and it is the responsibility of the installing contractor(s) to ensure that they are competent and trained in the placement of reinforced concrete. The **TT Admix Concrete Waterproofing System** comes with appropriate site support and visits to ensure concrete best practice has been followed during the installation stage. However, Wykamol-Triton have some of the best technical support in the industry and can provide relevant advice via digital file share and video calls if required. If you would like Wykamol-Triton to attend site during the project, please contact your local Technical Sales Manager, who will be able to advise accordingly. Upon completion of the project, concrete containing **TT Admix** will be visually inspected by Wykamol-Triton in order to issue the 10-year project warranty.

Note: Wykamol-Triton shall not be held responsible for concrete which is cracked, poorly compacted or otherwise defective because of poor workmanship or incorrect practices being carried out on-site. Defective concrete must be remediated at a cost to the groundworker/contractor. A warranty for TT Admix cannot be issued if defective concrete is found, or where best practice has not been followed.

Wykamol-Triton can offer advice on best practice for handling of all concrete containing **TT Admix**. This advice is given in good faith and in line with information published by several associations. If in doubt, please do not hesitate to contact our Technical Department for advice. Wykamol-Triton takes no responsibility for 3rd party literature, and information is given based on the best advice available at the time. This advice does not replace that of a qualified structural engineer or experienced project management in relation to handling and placing concrete on-site.

TT ADMIX

1. Concrete mix designs containing **TT Admix** must be submitted to us prior to any concrete being placed on-site. Prior to project commencement, we will attend site with the installing contractor to run through the system.
2. Having previous experience of the **TT Admix System** does not exempt installing contractors from taking part. All operatives on the project who will be handling our products must also attend. Where applicable we can advise on pour layout, curing and other aspects of **TT Admix** and its ancillaries.
3. Wykamol-Triton will attend site on an ad-hoc basis. We do not provide a full site service, therefore site images containing **TT Admix** placement, curing and construction joint preparation are acceptable but must show date and time stamp and be submitted to your local Technical Sales Manager prior to placement of concrete. Any images that show poor workmanship will not be covered by the warranty, unless it has been fixed on-site and evidence shown.
4. Remedial works (if any) are the responsibility of the contractor to carry out and complete. Wykamol-Triton is not responsible for any associated costs. Method statements for remedial works can be provided by an appointed concrete specialist if required. Wykamol-Triton can provide method statements for non-invasive repairs.
5. Warranties are issued subject to terms and conditions, and will only be issued when a final visit has been carried out.

It is the responsibility of the installing contractor to request (in writing) the Product Warranty for TT Admix, ensuring all concrete is still exposed for visual inspection and all invoices are paid in full prior to issue. Wykamol-Triton reserve the right to refuse to issue a Product Warranty if concrete is not left exposed for a final inspection. Do not install secondary systems or finishes until instructed to do so.

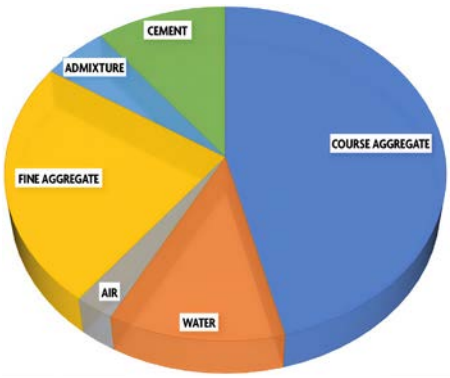
Site attendance does not constitute sign off, approval or acceptance. Wykamol-Triton carry out visits to check progress on-site. If remedial works are required, method statements can be provided. Ancillaries purchased should be part of the **TT Admix System** and specified by the manufacturer, to ensure all ancillaries are compatible with the system. In the event that intensive repair works are required, a 3rd party contractor may need to be appointed and terms agreed between the contractor and 3rd party. Wykamol-Triton can be provide company names upon request, however it is not Wykamol-Triton's responsibility to co-ordinate or facilitate these repair works on your behalf. 3rd party contractors may have additional requirements and these need to be agreed between yourselves.

READY MIXED CONCRETE

TT Admix must be purchased by the installing groundworker/ contractor directly from their chosen ready-mix concrete supplier. Nominated ready-mix concrete companies should be QSRMC or BSI accredited. This only applies where Wykamol-Triton have been involved in the design of the waterproofing and we have been asked to provide a warranty for the concrete prior to the project starting.

MIX DESIGN

Wykamol-Triton is not responsible for the design of the concrete. This responsibility sits with the ready-mix concrete supplier in conjunction with the requirements as set out by the structural engineer. A Product Warranty for **TT Admix** cannot be issued if the project commences without an accepted mix design from Wykamol-Triton.



TT Admix can be used with Ordinary Portland Cement (OPC), Ground Granulated Blast Furnace Slag (GGBS) and Pulverised Fuel Ash (PFA). Blended mixes are preferred subject to time of year.

A copy of the mix design must contain:

- WCR Ratio 0.45 (must not be exceeded)
- Total Binder - Minimum of 350kg/m3
- Slump – S3 (Pump Mix). Within a range of 120mm to 150mm prior to placement. Other slumps are acceptable dependent on application, but please consult with us first.

Additional water should not be added to the concrete truck. In the event the mix is too stiff it should be sent back to the RMC and a new batch mixed and delivered to site. Copies of concrete tickets may be requested from the installing contractor and any additional water added may void the Product Warranty.

Please note: The strength and grade of concrete is designed by others.

TT ADMIX PLACEMENT

- All concrete must be minimum of 200 mm thick, or 300 mm for monolithic/ deep concrete slabs
- All joints must have the correct ancillaries installed and these must be supplied by Wykamol-Triton.
- 3rd party materials used are not covered under the Product Warranty. Only our ancillary items should be used as we have test data confirming acceptance.

Best Practices

1. Must not be poured on live or standing water. Typical example of this is leaking piles or after heavy rain fall or flooding. Water should be removed to an acceptable level prior to placement.
2. Must not be poured against any incorrect joint preparation that compromises the waterproofing system. Contractors will be asked to re-prepare the area and send pictures.
3. Must not be dropped from an excessive height i.e., higher than 2 to 2.5 metres.
4. Must not be placed where adverse temperatures may affect the performance of the concrete. This is common during cold winter months. In the event that the RMC supplier batches concrete outside of these guidelines it is common for the delivery notes to be stamped with a note about adverse conditions or water addition and the installing contractor accepts the risk of potentially reduced performance. **TT Admix** in this situation will not be covered under any warranty.

Please contact our Technical Department for more information when required.

STANDARD DETAILS

Are available on request.

Concrete slabs containing **TT Admix** should be cast with a monolithic kicker. **TT Waterstop** (BDA approved) must be used to seal all construction joints. - Separate kickers will not be accepted under the **TT Admix** warranty due to the risk of under-compaction. For acceptable methods of construction for Type B systems please refer to BS8102:2022 for more information.

Wykamol-Triton have a range of construction joint sealing methods, to be agreed prior to project commencement. Any deviation from this, without prior consent, will not be accepted.

Please refer to your Representative in relation to projects using Insulated Concrete Formwork (ICF) systems.

CONSTRUCTION JOINTS

TT Admix concrete in both vertical and horizontal applications, should have clean exposed aggregate to ensure a good key is created between the old and new concrete. The easiest way to achieve good, exposed aggregate is to apply Wykamol-Triton's retarding agents. Apply Wykamol Gel Retarder to stop-ends and Wykamol Liquid Retarder to wall to kicker/slab interfaces.

Once stop-ends are removed the next day, jet wash to remove all traces of the retarding agent, debris and laitance, and expose a clean aggregate surface. Allow to dry before applying **TT Swellmastic S2** and **TT Waterstop**.

Once the joints have been jet washed allow to dry sufficiently.

TT WATERSTOP

TT Waterstop installation is carried out as per the following:

1. Create a rebate at vertical stop-ends and horizontal kicker joints.
2. Rebate must be installed at 20 mm wide x 15 mm deep.
3. When the joint and rebate has been cleaned and prepared, install a continuous bead of **TT Swellmastic S2** to fill half of the void (refer to relevant data sheet for application instructions). Once **TT Swellmastic S2** has been applied, install a continuous strip of **TT Waterstop** and press firmly down. The waterstop should be half in and half out of the recess.

Note: ***Please ensure you never discharge concrete or directly drop this at force onto the TT Waterstop joint or it may dislodge, especially if the TT Swellmastic S2 has not been allowed to harden slightly first. If necessary, the TT Waterstop can be nailed in at 200 mm centres using a Hilti gun or fixed in place with a mesh.***

You should avoid leaving **TT Waterstop** exposed to the elements for long periods e.g., over the weekend during wet conditions, as this could activate the system early and **TT Waterstop** may need to be removed and replaced. **Cemflex Metal Waterbar** is available when adverse conditions or a long delay to the pour is anticipated.

Fixings

Fixing into **TT Admix** concrete is acceptable, however care must be taken not to compromise the system and induce cracking. Cracking is not covered under the product warranty.

Capping Beams

When constructing capping beams in deep basement construction, these are typically carried out in one of three different ways:

1. Capping beam with liner wall in front (preferred).

The construction of this is very easy and one of the most robust for avoiding water ingress at the liner wall to underside of capping beam construction joint. The method is simple and involves bringing the liner wall up to be cast in front of the capping beam. However, it is still encouraged that the liner wall remains at least a minimum of 200 mm thick for optimal performance of the admixture. For support, please contact your local Technical Sales Manager or our Technical Department.

2. Liner Wall cast to underside of the capping beam

Should the preferred method set out in option 1 not be possible, an alternative method is to cast the liner wall to the underside of the capping beam, pouring the concrete through each pipe penetration. **Note:** The pipe penetrations would be installed

curing the capping beam pours. Please refer to our typical details for casting in service pipe penetrations for more information.

Typical sleeve dimensions should be between 100-125 mm and installed at 1 metre centres and the concrete is poured through the sleeves (lower the end of the line and do not drop from more than 2 to 2.5 metres).

3. High-flow TT Admix / Self Compacting Concrete

TT Admix can be used as a self-compacting mix or high-flow consistency in the event that heavily congested reinforcement is present, or where other limitations exist, such as when in-situ concrete (traditional methods) is not ideal. When self compacting concrete of high-flow mixes are used, it is also acceptable for the concrete to be pumped from the bottom upwards (as well as applied top down). Please contact the Wykamol-Triton Technical Department for more information.

Wykamol-Triton does not design self-compacting mixes. These are designed by the ready-mix concrete supplier and approval must be sought by the structural engineer. Honeycombing may still occur with self-compacting mixes and Wykamol-Triton takes no responsibility for the concrete application or design. Formwork must also be designed by a suitably qualified person(s) and robust enough to withstand excess pressure / force from the concrete.

SWIMMING POOLS / LIQUID RETAINING STRUCTURES

TT Admix is acceptable for use in the construction of a swimming pool. All swimming pools should be designed by the structural engineer to the relevant standards and crack width limits. Where finishings by follow-on trades are required, advice should be sought by the 3rd party prior to installation of concrete. Wykamol-Triton is not responsible for any cracking that may occur where the concrete needs to have a rough or medium exposed aggregate finish.

All swimming pools should be fully tested in line with the relevant standard it has been designed to and tested for any cracks within the concrete which may impact on the water level loss and performance of the water retaining structure. Please consult your structural engineer for more information.

Piling

Where water tightness of the wall is attempted without the use of a **TT Admix** waterproof concrete wall (slab edge poured directly up to the steel sheet piles) we strongly recommend that the joints between the piles are fully welded before the basement slab is placed, otherwise any leakage through the pile to slab joint will be very difficult to seal.

Under BS8102:2022, sheet piling design for deep basement construction is an acceptable design method for Type B construction. However, for the purpose of a **TT Admix** Product Warranty, further safety factors have been added under the terms of our warranty.

Where Type B is designed and piling is utilised, the design of a liner wall using **TT Admix** must also be included. Where a liner wall is not being constructed, our position is set out below.

Steel Sheet Piling

In the event steel sheet piling is being used on-site and water tightness is necessary without the use of a **TT Admix** liner wall, all the clutches and joints of the sheet piling must be fully welded prior to the installation of the basement slab in **TT Admix**.

Please note: Welding is never 100% watertight, and the level of water tightness is down to the expertise of the welder on-site. Please ensure the operative has the necessary competency, qualifications or skills.

Our warranty will not cover this design, nor do we assume responsibility for the water tightness of the sheet piles.

Prior to pouring the basement slab against the sheet pile, these are typically designed with a welded plate to limit the path of water. Insurance houses such as NHBC, Premier Guarantee and most manufacturers accept the use of waterbar at these interfaces. However, experience has shown that waterbars installed at this interface are not the best method of installation. Wykamol-Triton recommends appointing a 3rd party specialist contractor to install injection hose systems and **TT Admix** ancillaries at these locations. Wykamol-Triton do not include these interfaces under our warranty, but a third-party specialist contractor may offer a separate level of guarantee for this aspect of the project.

Secant and Contig Piling

As with steel sheet piling, your Wykamol-Triton representative will be happy to provide you with the contact details of a third-party specialist that can issue a separate warranty. Wykamol-Triton do not accept secant / contig piling as part of Type B construction design nor is it covered under our warranty / PI insurance for design / advice.

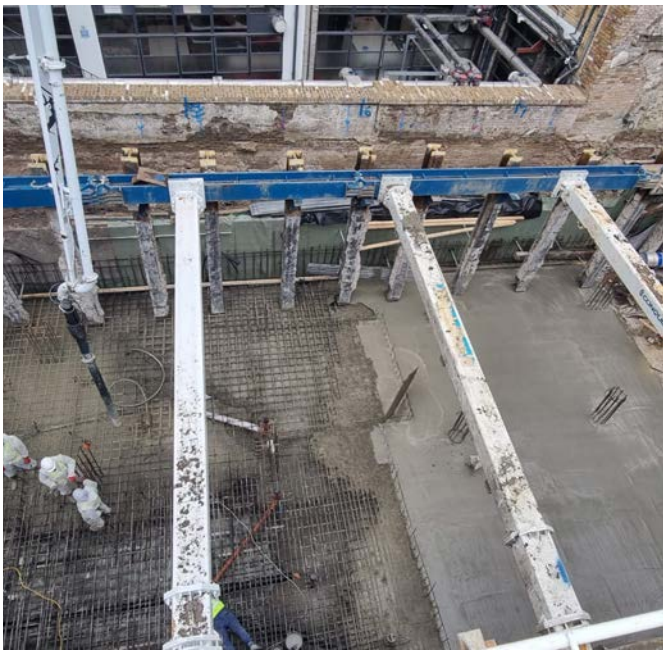
Curing Concrete

TT Admix concrete should be cured in the same way as standard concrete with the added objective of achieving a crack-free, watertight structure. Please refer to the relevant standards and 3rd party literature for the desired type of curing.

In the event that cracking appears, whether this is thermal, restraint, structural movement, plastic or drying shrinkage following formwork striking or the removal of insulated curing blankets on the slab etc., advice should be sought. All cracks must be repaired by the contractor in line with recommendations from the Wykamol-Triton Technical Department, prior to the issuing the warranty and completion of the project.

It is essential that sufficient curing compounds are used to control cracking and heat of hydration. Wykamol Cure 90 is an aluminised 90%, high-efficiency curing membrane for concrete. It reflects solar heat away from the substrate and ensures the concrete retains the optimum amount of water (in excess of 90%). Please consult the relevant technical data sheet for more information. As the curing compound dries you can no longer see the colour as it is absorbed into the concrete.

Note: ***Curing concrete is never a one size fit's all approach due to the many different types of methods available. Concrete (regardless of whether it is waterproof concrete or not, will shrink as it hydrates / cures. It is vital that adequate concrete curing is carried out to reduce the number of cracks.***



GENERAL GUIDELINES TO HELP REDUCE CRACKING IN CONCRETE

Concrete Striking Times

Formwork striking times cannot be pre-determined, but should be assessed according to the type of cement used, the thickness of concrete, ambient temperature, seasons and site conditions. It is assumed that the lowest risk approach is to strike the formwork when the temperature of the core (within the concrete that has been poured) reaches ambient temperature and the concrete has achieved an initial strength of 10 MPa.

Aspect Ratios

TT Admix comes with no defined rules when planning and sequencing the pour of concrete, although we strongly advise following best practice in line with 3rd party advice. The advice given is the best available within the industry at the time these publications are live and in print. Industry codes of best practice advise that:

- **Slab pour** ratio 1:1 and consist of being as square as possible.
- **Podium slab** does not exceed the recommended size of 1.5:1 as detailed by 3rd parties.
- **Capping beams** Although no specific advice exists for capping beams, 10 metres is deemed sufficient. Capping beams are determined by building and excavation programmes, and a structural engineer should be consulted prior to pouring concrete.
- **Mid-sections** are avoidable on some sites therefore, 1.5 metre infills generally pose the lowest risk to confine any restraint cracking to a smaller area.

Pour Sequencing

When it comes to pour sequences in both slabs and liner walls, a continuous programme should be followed. When casting liner walls, we advise pouring multiple wall sections at once, starting with opposite ends of the build, and meeting in the middle with one infill section.

Pour Layouts

Pour layouts should be agreed between the structural engineer and the installing contractor, considering all aspects of the build programme, concrete and reinforcement design. **TT Admix** does not induce cracking of any kind and cracks that do appear are confined to the handling on-site, curing and sequence of works. Wykamol-Triton is available to provide input on this, in line with best practice, but the final decision is outside of our control. In the event cracking may occur, Wykamol-Triton can provide a method statement on how best to remediate the cracks, but the installing contractor should also consult the structural engineer to rule out any other likely cause(s) e.g., movement etc.

Podium / Suspended Slabs

TT Admix, requires a minimum of 300 mm concrete thickness when using our material in such applications and cracking should be designed to not exceed 0.2 mm crack widths.

Warranty

As soon as the project is completed, please contact Wykamol-Triton to arrange a final inspection of the concrete.

Warranties are issued to the installing contractor responsible for ordering and settling invoices. Final inspections are not carried out until at least 28 days has passed to allow for the final section of concrete to fully cure and reach designed strength.

Areas of concrete showing cracking must be remediated at cost to the contractor prior to the warranty being issued.

Wykamol offer a 10-year product on TT-Admix. In the event a longer warranty period is required, please contact your local Technical Sales Manager prior to the project commencing on-site. Each request is assessed on a project by project basis.

TT ADMIX BEST PRACTICE

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