

# WILOTEKT-PLUS STRUCTURAL WATERPROOFING TECHNICAL GUIDANCE

## APPROVED SUBSTRATES

**Structural Concrete Deck (Dense Concrete)** - The concrete should be wood floated or have a light brushed finish to ensure a secure adhesion. The concrete must not be tamped or have a smooth power float or skip float finish. The concrete must be appropriately cured. The recommended minimum curing time is 28 days and moisture content of the structural deck must be below 6%. Depending upon on-site conditions, weather cycles post installation and ambient temperatures, it may be possible to install WILOTEKT-PLUS structural waterproofing onto a concrete deck that has been left to cure for a minimum period of only 14 days. System installation upon such substrates is only permitted following the successful completion of an adhesion test that should be conducted in the presence of Axter's Quality Assurance division.

**Structural Concrete Deck (Lightweight Concrete)** - The lightweight concrete should be wood floated or have a light brushed finish to ensure a secure adhesion. The concrete must not be tamped or have a smooth power float or skip float finish. The concrete must be appropriately cured. The recommended curing time is 28 days and moisture content of the structural deck must be below 6%. An adhesion test must be carried out in the presence of Axter's Quality Assurance division in order to confirm correct adhesion.

**Concrete Installed into a Profiled Metal Deck (Permanent Shutter)** - the surface of the concrete should be wood floated or have a light brushed finish to ensure a secure adhesion. The concrete must not be tamped or have a smooth power float or skip float finish. The concrete must be appropriately cured and moisture content of the structural deck must be below 6%. Curing times are increased for this type of construction method and may be up to 60 days before correct adhesion can be achieved. An adhesion test must be carried out in the presence of Axter's Quality Assurance division in order to confirm correct adhesion.

## APPROVED SUBSTRATES

### UNSUITABLE SUBSTRATES

**Aerated/Insulating Concretes** - Concrete mixed with lightweight aggregates such as Perlite, Pumice and/or Vermiculite have a very low density, are porous and will retain significant moisture. High moisture contents within this type of substrate will severely compromise system adhesion and should be avoided. Latex, resin, or polymer treatments can be applied to the surface of aerated/insulating concretes in order to improve adhesion, however, Axter do not condone this method and installation onto aerated/insulating concretes should be avoided.

**Plywood, OSB or Timber** – Although it is possible to install WILOTEKT-PLUS structural waterproofing systems onto a plywood, OSB or timber deck, provided the correct preparation techniques have been completed i.e. fixings counter-sunk, joints securely taped with Axter STICKBAND 100, and the deck correctly supported and designed to withstand the inverted roof load, Axter do not recommend the installation of hot poured molten products onto combustible substrates and strongly consider this ‘Hot-Melt’ type waterproofing material to be best suited to concrete substrates only. NB moisture content of timber decks must be below 6% to ensure satisfactory adhesion.

**Screeds** - Screed to falls can be installed to a concrete structural deck prior to installation of the WILOTEKT-PLUS system. Screed to falls must be allowed to completely cure/dry out prior to attempting to install the WILOTEKT-PLUS, must have a moisture content below 6% and must have an appropriate surface finish suitable to receive the waterproofing system. An adhesion test must be carried out in the presence of Axter’s Quality Assurance division in order to confirm correct adhesion. It should be noted that due to the porous nature of screeds water may be able to track beneath the screed and thus beneath the waterproofing system during construction or post construction if the system is damaged. Axter recommend falls be achieved within the concrete deck rather than resorting to screeds.

**Drainage Falls** - Axter is a pro falls organisation and actively seeks to promote the design and implementation of positive drainage falls in excess of 1:60 on all roof types. WILOTEKT-PLUS has been approved for installation on a zero fall roof slab/deck, is CE marked and has achieved third party attestation in the form of European Technical Approval ETA-03/0049. A zero fall roof was formerly defined as a roof achieving a fall between 0 and 0.7 degrees post deflection and tolerance. However, in December 2018 the British Standards Institute (BSI) published the new and updated BS 6229 : 2018 Flat roofs with continuously supported flexible waterproof coverings – Code of Practice. This new code of practice defines a zero fall roof as a roof with a slope which lies between 0 and 1:80. In order to ensure a finished surface with a zero fall, a design fall of 1:80 should be used and a detailed structural analysis should account for construction tolerances, settlement and deflection under load. If negative falls and/or ponding occurs then remedial action should be taken in the form of a localised screed or the addition of rainwater outlets at the lowest point.

It should be noted that a zero fall design will adversely affect the thermal performance of inverted roof insulation due to the water cooling effect of rainwater flowing through to the insulation. Thermal calculations in accordance with BS 6229 : 2018 should be completed by the system manufacturer and/or specialist consultant accredited to undertake such work to determine the thermal performance of the roof system. Correction factors relating to the cooling effect may be applied to inverted roof thermal calculations in compliance with BS 6229 : 2018 and the manufacturers Agrément certificate. Only inverted roof insulation boards approved for installation at a zero fall with a third party certified (British Board of Agrément/BBA) water flow reducing layer (WFRL) tested in accordance with Appendix C ETAG 031-1 should be considered for use.

## CONCRETE CURING AND DRYING

**Curing Additives** - These compounds are a popular method of reducing the curing times of concrete decks, as they are simple to apply and low cost. Liquid curing additives however, may result in a 'skin' forming on the surface of the concrete that significantly impairs the evaporation rate of retained moisture that may harm adhesion and slow down the installation process. See below further guidance in relation to concrete curing additives:

**Satisfactory Additives** - dependent upon applicator's proficiency and/or preparation techniques employed post cure.

**Sodium Silicate** - When applied properly by a specialist contractor should not leave a skin on the surface of the concrete that would otherwise affect the adhesion of the WILOTEKT-PLUS to the concrete surface.

**Resin Based** - It should be acknowledged that this type of additive will form a film on the surface of the concrete that may take up to 60 days to oxidize and become dislodged. This layer can be removed by abrasion, or treating with a light solution of muriatic acid or trisodium phosphate (TSP). Resin based curing additives should only be employed if all parties are aware that significant surface preparation techniques will be required to ensure satisfactory adhesion. Such preparation techniques may be costly and will slow down the installation process.

**Unacceptable Additives** - Must be avoided.

**Wax Based** - Wax based additives severely reduce and weaken the bond between the WILOTEKT- PLUS and the structural concrete and must be avoided.

**Acrylic Silicate** - Forms a permanent film on the surface of the concrete and will prevent the WILOTEKT-PLUS from adhering to the concrete and must be avoided.

*The above information is provided for guidance purposes only. Please contact Axter Limited's Technical Department for comprehensive advice prior to employing the use of concrete curing additives.*

Concrete substrates must be sufficiently cured to ensure correct adhesion is achieved with the WILOTEKT-PLUS. General good practice and all appropriate British Standards and building regulations recommend minimum curing times of 28 days for standard dense concrete decks, increasing to 60 days for concrete poured onto a metal formwork or permanent shutter.

## SURFACE PREPARATION

The cleaning and preparation of a concrete deck consists of thoroughly removing all dirt, debris and dust by means of sweeping, wet/dry vacuum, compressed air/blow cleaning and/or high pressure washing, prior to applying the WILOTEKT surface conditioning primer. However, substrates can be affected by surface contaminants that cannot easily be removed by traditional sweeping such as laitance, material spillages, residues created by liquid curing additives. When any of these substances are present on the concrete surface they must be removed prior to the application of the WILOTEKT- PLUS. See below substrate preparation guidance:

**Cleaning Agents** - This technique may be necessary to remove oil, grease, and dirt. The concrete should be thoroughly cleaned with Caustic Soda, Trisodium Phosphate or other appropriate and approved detergents formulated for use on concrete. Post cleaning, the surface of the concrete should then be sluiced with water to remove all traces of the cleaning agent. Solvents must not be used.

**Surface Scabbling/Scarification** - An effective mechanical method of effectively removing dirt build up, and surface laitance. High pressure washing after treatment will ensure any loose concrete and dust present after the process is removed.

**Sand Blasting** - Sand blasting is an extremely effective method to remove surface laitance or structurally unstable concrete surfaces. Further cleaning such as high pressure washing will also be required after sandblasting.

**Acid cleaning** - An unconventional preparation method that is not preferred and to be used as a last resort. Suitable safety precautions must be in place prior to implementation and operatives must be fully trained and briefed in the safe application of acid cleaning products. In all instances extreme care must be undertaken to ensure safe disposal of contaminated water sources.

**Concrete Surface Defects** - All holes, cracks, depressions and faults in the concrete surface should be cleaned out and infilled with a suitable mortar. All drainage falls should be checked prior to installation of the system by the project engineer in conjunction with the concrete specialist contractor. All defects should be remedied by the specialist contractor to ensure decks are to falls, drain sufficiently and that outlet positions are located accordingly and make allowance for deflection. All sharp edges, protrusions and surface irregularities that may damage the system during installation or cause irregular system depths should be removed prior to installation of the WILOTEKT-PLUS.

## SURFACE PREPARATION

**Concrete Density** - Correct concrete density is critical to ensure structural stability of the concrete surface and in turn correct adhesion. If the density of the concrete is below 1850 kg/m<sup>3</sup> it is possible that the surface of the concrete will become friable and excessively dusty. This will result in the WILOTEKT surface conditioner not isolating this element and unsatisfactory adhesion being achieved.

**Recommended Surface Finishing** - Wood float finishes are the industry approved and accepted method of finishing concrete substrates that are to receive 'Hot Melt' structural waterproofing systems, specifically WILOTEKT-PLUS. This type of finish will provide the WILOTEKT-PLUS with a rough, strong key in order to achieve an excellent bond. Wood float finishes will also ensure an even level surface so that an even depth of waterproofing (7mm) is achieved. Metal plate and power float concrete finishes are unacceptable and not permissible.

The information within this document is provided in good faith and for guidance purposes only. Axter Limited reserves the right to alter/amend installation guidance at any time without notification. Please contact Axter Limited's Technical Department for comprehensive advice prior to specifying WILOTEKT-PLUS.