



(NOTE: With the addition of structural fibres made of type 540 STRUCS polyolefin, ordinary concrete is transformed into Fibre Reinforced Concrete (FRC), which allows the construction of waterproof pavements, foundations and walls with the total, or partial, replacement of steel reinforcements. The technical and economic advantages and increased durability are particularly significant). The absence of infiltrations at the key joints of the buried structure is assured with the help of **WATERSTOP B/25.20** sodium bentonite waterproofing and **RING GASKET (L19 or T21)** and **CORK GASKET T21** gasket seals for the form spacers. The result is a dense composite (fibre-reinforced) concrete structure with a drastic reduction of "weak points" (free lime) and a significant increase of its intrinsic waterproofing. Any water infiltrations that may, in some way, happen during the construction of the buried structure (cracks due to differentiated subsidence, wasps nests caused by poor vibration, etc.) will be sealed, with simple application and sure results, with the application of **SYNTECH HAG (ECO and/or FLEX)** hygroexpansive polyurethane resins. The profound modifications to the matrix and structure of the concrete, condensed in the **BETONSAFE** method, are based on the assumptions of ACI 116 R and SFA documents as well as the EC2 Eurocodes and documents and standards related to FRC FIBRE-REINFORCED CONCRETE.

BETONSAFE, sleep well !

BETONSAFE® - THE ADVANTAGES OF THE METHOD

EASY OF USE: The waterproofing of the buried space is directly in the concrete mixer. By simply adding **MICROSTANDARD** or **MICROPLUS** and **FIBRE**, suitably prepared, reactive components are introduced that profoundly transform the concrete from normal concrete to waterproof.

ELIMINATION OF DEAD TIME WHEN PREPARING

WATERPROOFING WORKS: At the same time that you're pouring the concrete, you are also waterproofing.

WATERPROOFING: No more stressing waits to allow the waterproofers to begin working.

ELIMINATION OF THE COST OF SUPPORT FROM SPECIALIZED

COMPANIES: The costs of storing waterproofing materials at the job site and energy costs, etc., are eliminated.

ELIMINATION OF DEAD TIME DUE TO THE IMPOSSIBILITY OF PERFORMING WATERPROOFING DUE TO BAD WEATHER: Cold, frost, rain and high temperatures, etc., at the job site will no longer be considered obstacles to waterproofing.

TOTAL ELIMINATION OF THE ADDITIONAL COSTS OF TRADITIONAL

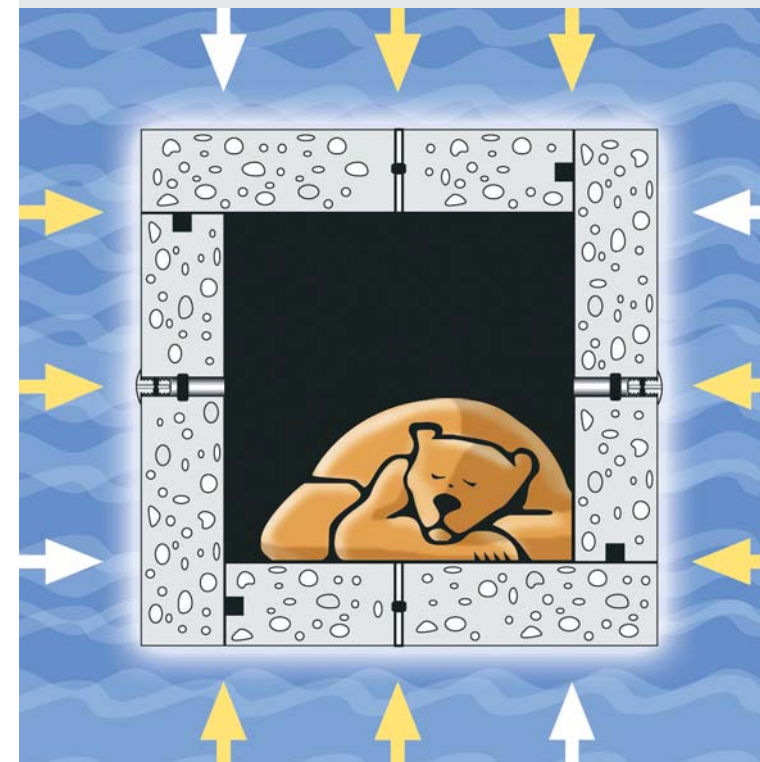
WATERPROOFING WORK: The waterproofing protection systems (ashlars of various types, TNT, etc.) all disappear; backfilling can be done immediately after removing the forms using any type of material (sand, rocks, crushed inerts, recovered inerts, rocks, etc.).

CHARACTERISTICS OF PRODUCTS MADE WITH THE BETONSAFE METHOD

- SHARP INCREASE IN MECHANICAL RESISTANCE.
- INCREASE IN THE COHESION AND STABILITY OF THE MIX (INHIBITION OF SEGREGATION AND SURFACE BLEEDING).
- MARKED RESISTANCE TO BEING WASHED AWAY.
- SHARP INCREASE IN INTRINSIC WATER-RESISTANCE.
- SHARP INCREASE OF RESISTANCE TO ABRASION AND CAVITATION.
- SHARP INCREASE IN CHEMICAL RESISTANCE.
- INHIBITION OF PERNICIOUS ALKALINE-AGGREGATE REACTIONS.
- DRASTIC REDUCTION OF EFFLORESCENCE.
- SHARP INCREASE IN OVERALL DURABILITY.



**METHOD FOR MAKING
HIGHLY WATERPROOF CONCRETES
FOR THE CONSTRUCTION OF
HERMETICALLY SEALED STRUCTURES
BELOW THE WATER TABLE**



TECNOB
PRODOTTI E SOLUZIONI PER L'EDILIZIA SPECIALIZZATA

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WHAT IS BETONSAFE®



BETONSAFE impermeability and constructing buried structures below the water table with a secure hermetic seal. The method, which has, by now, been tested through twenty years of practical applications on job sites throughout Italy (civil and industrial buildings, water works, sea works, concrete pavements, swimming pools, tanks, aqueducts, etc.), is based on in-depth knowledge of the nature of concrete and the causes of water infiltrations in buildings. On the one hand, the components of the **BETONSAFE** method cause a profound transformation of the concrete, from “normal” concrete to “impermeable” concrete and, on the other, ensure the absence of infiltrations in the key connection points of the buried structure (both horizontal and vertical casts, blade and tube form spacers, pass-through tubes, etc.) using specific sealing techniques (bentonite and PVC waterstops, hygroexpansive sealants in cartridges, etc.). The profound transformation of the concrete, prepared with a suitable mixdesign, is made through the addition of a polyvalent, composite super-fibre-reinforced powder waterproofing additive based on thickened and selected micro-silicates, micro-fibres of calcium metasilicate, alkaline-resistant Fibreglas and specific **MICROSTANDARD** or **MICROPLUS** agents and, with the purpose of providing anti-crack protection and reducing the absorption of water, **ECOMICS 180** polypropylene fibres.



BETONSAFE®

SLEEP WELL

www.betonsafe.it

COMPONENTS OF METHOD

MICROSTANDARD

MICROSTANDARD is a special “additive”, compound, multifunctions (UNI EN 206-1:2006, 3.1.23, type II: pozzolana additives) able to product interesting transformations in cement pasta, in structure and concrete performance. **MICROSTANDARD** is most made by thickened reactive micro-silicates, selected sands of very thin granules, as well as a special mix of polypropylene multifilament fibers and minerals microfibrils (Wollastonite) with a contribution of matrix expressible, for the usual dosages, by reason of 800/1000 microfibrils, mineral granule of cement. The reactive fillers present in **MICROSTANDARD** determine a high effect of cohesive thickening of conglomerate and great linking increasing of concrete, in a mix able to maximize the functions of fibres dissolved in it. For this reason, the concrete with **Microstandard**, can be considered a compound material, fibro-reinforced of elevated quality. *By varying the dose from case to case, the peculiar properties of **MICROSTANDARD** allow defining various categories of finished concrete.*

MICROPLUS

Consisting of thickened and selected microsilicates, kaolinic reactive micro-filler, stabilising agents, alkaline-resistant Fibreglas and calcium metasilicate micro-fibres, **MICROPLUS**, the basic product of the “Betonsafe Method”, is a special, multi-functional “additive” (UNI EN 206-1:2006, point 3.1.23, type II: pozzolanic additive), capable of causing profound transformations in the cement paste, structure and performance of the concrete. **MICROPLUS** must simply be added to a correctly prepared concrete, in conformity with current standards (in particular with UNI EN 206-1:2006 “Concrete: specification, performance, production and conformity”), as a function of its specific use, the atmosphere of exposure and the consistency values induced by the method of application. The correct mixing and homogeneous distribution of **MICROPLUS**, with the usual components of the concrete, is a fundamental prerequisite. For this reason, particular attention must be paid to mixing, which must continue to the elimination of lumps (for convenience, we have adopted the following empirical rule: 1 minute of mixing for each cubic meter of concrete, at the maximum speed of rotation of the concrete mixer’s drum). In any case, **MICROPLUS** can be added either in the mixing plant by gradually distributing it on the aggregate conveyor belt, or directly in the concrete mixer truck at the job site. *By varying the dose from case to case, the peculiar properties of **MICROPLUS** allow defining various categories of finished concrete.*

FIBRE ECOMICS 180

FIBRE ECOMICS 180 is an auxiliary poly-propylene multifilament micro-fibre, with a length of 18 mm., suitable for the addition of concrete conglomerates. The addition of **FIBRE ECOMICS 180** to the mixture allows to contrast the phenomenon of plastic retreat split of the concrete, in addition to having positive effects on the ductility of the mixture, frost- defrost resistance, push resistance and the whole waterproofing. Packaging: Boxes of 12 kg with 12 sacks 1 kg each Consumer 1 kg./m³ of concrete (n.1 sack)

WATERSTOP B/25.20

Preformed hygroexpansive joint sealer for the hermetic sealing of casts in structures, walls and foundations, made with a mixture of sodium bentonite and special aggregating polymers, it is normally fixed in the work, preliminary to pouring the concrete, by riveting. Expansion potential: up to 5 times its initial volume. Dimensions: 25 x 20 mm in 5-m coils - Packaging: box of 6 coils (30 m) Appearance: Cord - Colour: black.

RING GASKET L-19

Hygroexpansive gasket for hermetically sealing metal blade spacers, panels and wooden cast containment forms. It is applied, in a central position with respect to the spacers, with a special “three-nose pincer”. Consumption: n° 6-8 gaskets/m² of form work. Appearance: Rectangular ring gasket - Colour: blue - Packaging: Bag of 200 pieces.

RING GASKET T-21

Hygroexpansive gasket for hermetically sealing tubular PVC spacers, panels and metal casting containment forms, which is applied in a central position with respect to the spacers. Consumption: n° 1-2 gaskets/m² of form work. Appearance: Circular ring gasket - Colour: blue - Packaging: Bag of 100 pieces.

CORK GASKET T-21

Hermetic closing device for tubular formwork spacers consisting of a rigid core of polyamide plastic and a corrugated, hydroexpansive rubber cap; applied with hammer. Consumption: n° 1-2 gaskets/m² of form work. Appearance: Plastic cap - Colour: blue - Packaging: Bag of 100 pieces.

FLUID ENTER

This is a mono-component impregnating protectant based on modified waterglass. Waterproofing and consolidating, it gives concrete extraordinary protection against degrading agents such as acids, salts and sulphates. Applied with a low-pressure manual or electric (airless) pump, **Fluid Enter** is a permanent treatment that deep-seals the pores of the cement matrix, making the concrete resistant over time to the penetration of water, chemical attack and freezing-thawing. Consumption: the product's yield per square meter varies as a function of the absorption capacity of the surface treated. In general, it is good practice to treat concrete to saturation. In our experience, the typical dosage ranges from 2 to 4 m³/litre - Conservability: 12 months in an unopened and protected package.

