

## TECHNICAL DATA SHEET

# MICROGUARD<sup>®</sup>

TOP LEVEL ADMIXTURE FOR CONCRETES  
AND MORTARS 100% WATERPROOF - HIGH  
PERFORMANCES-DURABILITY

### DESCRIPTION

**MicroGuard** is a new generation of high-efficiency reactive compound admixtures for concrete and mortar. It is in powder form and based on active nano and micro silicates that combines a very high pozzolanic activity with an exceptional and unique rheology and fluidity without segregation. Characteristics are 100% water proofing and high resistance to mechanical compression with top level protection to all chemical and atmospheric attacks. The durability of structures will be at least doubled.

### FEATURES

MicroGuard consists of spherical particles equal to the size of a few hundredths of a micron, so that its specific surface area is quite high: more than 220,000 cm<sup>2</sup>/g (Blaine). This characteristic gives it a high dispersion and reactivity on cement grains and a high ability to capture and fix the calcium hydroxide [Ca (OH) 2] and to transform it primarily into a silicate hydrate and subsequently into stable and irreversible calcium silicate. It should be noted that in all the cement-based mixtures, to obtain a good workability, it is necessary to use a quantity of water always higher than the quantity required for the hydration of the cement. This causes the formation of capillaries and cavities in the hardened cement paste. Water quantity plays a big role in increasing these cavities and capillaries in the paste.

MicroGuard, despite its high surface at the nano molecular level, guarantees concretes with easy and good workability without the use of additional super plasticizers, without shrinkage and with extreme final high performances in all the mechanical aspects.

Due to its chemical conformation, MicroGuard accelerates the cement hydration. Therefore, during the summer season it is highly recommended to do some precautionary tests.

If added to the mixture at a rate of 3 – 4% by weight of cement, MicroGuard captures and reacts with the free lime, filling the gaps in the cement paste. This makes it more compact, impermeable, resistant and consequently more long lasting. This additive

allows the packaging of rheoplastic concretes and rheo-dynamic SCC with very low w/c ratios.

### HOW TO USE MICROGUARD

**MicroGuard** is used for all quality concretes and mortars that require homogeneous concretes, highly workability with a very low W/C ratio with excellent finishing of the exposed surface, resistant to external aggressive agents, with low compensated shrinkage, and high resistance to compression, flexion and traction.

**MicroGuard** physical effects and positive reactions:

- 100% waterproofing in the mass
- Drastic reduction of porosity
- Extensive increase in all mechanical performances
- Increase of density and chemical stability
- Increase in life expectancy of structures
- Job site time saver
- Concrete or mortars with high mechanical resistance
- Pre-stressed concrete resistant to chemical attacks
- Concrete for vertical formworks (slip-form);
- Concrete or mortars for under-water applications especially in aggressive environments
- Tixotropic mortars for restauration
- Anti-shrinkage mortars, both pre-mixed and dump

In any case where higher performances are required to the mortar of concrete

- mechanical resistances
- chemical resistances
- resistance to cavitation and wear
- impermeability
- stability and cohesion
- compensated shrinkage
- general durability

It is also used to reduce the bleeding of the concrete, enables a high degree of pumpability, and at the same time enormously increases all mechanical characteristics and durability.

**MicroGuard** is also particularly recommended for concretes where there is a lack of fine material in the distribution of grains.

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## PECULARITIES

**MicroGuard**, despite the very reduced size of its particles:

- does not require the use of high fluidifying agents, but through its use it is possible to have self-compacting concretes with very low water dosages;
- it gives more workability to the concrete;
- it facilitates the pumping ;
- guarantees high mechanical resistance without plastic shrinkage;
- guarantees a better aspect of the exposed surface and a better finishing;
- guarantees total impermeability;
- guarantees durability and resistance to all exposure classes

## PHISICAL PROPERTIES

Appearance:	Powder
Colour:	Silver
Granulometry:	0-30 µm
Bulk density:	400-600 g/dm <sup>3</sup>
Solubility in water:	insoluble
pH:	5,5 ± 1
Specific Surface:	20-30 m <sup>2</sup> /g

## DOSAGE

The dosage of MicroGuard is mixed in concrete at a ratio of 3-4 % of the cement weight in the cubic meter depending on the mixture to be added and the desired characteristics.

However, the ideal dosage recommended ranges from 3 to 3.3 % by weight of cement.

Other doses can still be used, different from those recommended, but only prior performing preventive tests.

## CURING OF CONCRETE

The reactions of the pozzolanic effect are quite long and generally take place in a moist environment; for this reason it is required adopt a proper

curing of the mortar or concrete to prevent a rapid drying processes.

In this respect, during the first phase of hardening, it is recommended to protect the casting with sheets of polyethylene applying subsequently on the exposed surfaces, which will avoid a rapid evaporation of the casting, allowing them to have a correct pozzolanic reaction.

## STORAGE AND CONSERVATION

If stored in a dry place in the original packaging perfectly closed, MicroGuard is valid for 12 months. The moisture possibly adsorbed by the product does not affect its effectiveness, but can make its dosage difficult and imprecise as well as affecting the homogeneous distribution in the finished mixture.

It is therefore advisable to close bags carefully after each use.

MicroGuard is available in 9 Kg bags, in 500 Kg big bags or 1.000 Kg mega bags .

The bulk product is transported with classic torpedoes and can be stored under normal silos for cement and dosed with the equipment of the batching plant or through a mixing implant for big- bags.

## PACKAGING

- Bags 9 Kg
- Big-bags of 500 kg
- Mega Bags 1000 kg

## WARNINGS

**MicroGuard** is harmless to skin contact. It is easily removable from any surface with water and soap. Inhalation can cause a slight irritation of the upper respiratory tract for which we recommend the use of a dust mask .In case of accidental loss, the dry product shall be collected and disposed in a sanitary landfill .