



# MAPECRETE SYSTEM



# Mapecrete System

**Mapecrete System** is a sound technology

by Mapei S.p.A. for producing shrinkage-compensated concrete, where a high degree of dimensional stability is required to prevent shrinkage cracks in structures.

**Mapecrete System** is based on the principle that shrinkage in volume may be restrained by a structural reinforcement system. Mapei S.p.A. has a complete range of products able to control the chemical and physical processes within concrete over time. By selecting the right quantity of suitable admixtures the amount of shrinkage in concrete may be calculated and, therefore, controlled.

**Mapecrete System** is applied by combining a blend of three different admixtures within the concrete. The effect of this system is guaranteed by the synergic effect of the three products.

## AREAS OF USE

There are no particular drawbacks with **Mapecrete System** and it may be used for any type of structure. The system, which guarantees a reduction in the level of shrinkage cracks, reduces the amount of weak points in the concrete, increases its durability, thereby extending the service life of the structure.

**Mapecrete System** has been successfully used on various constructions, including in areas with structural requirements. These are some of the most common areas of use:

- *Industrial floors*
- *Multi-storey car parks*
- *Pre-cast concrete members*
- *Floor joists and piles for industrial viaducts*
- *Floor slabs for viaducts*
- *Hydraulic structures*

With industrial floors, where cracks caused by hydraulic shrinkage are one of the main causes of deterioration, this phenomenon is controlled by inserting joints in appropriate positions.

**Mapecrete System** allows the number of contraction joints to be reduced and, in certain cases, to be completely eliminated.

**Mapecrete** technology is also successfully used for floor slabs on viaducts. With this particular type of application, since the structure will always be exposed to temperature variations wherever they are located, expansion joints are always required.

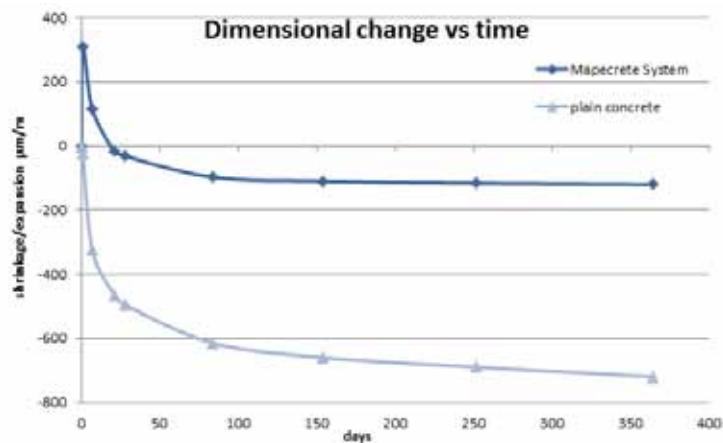
**Mapecrete System** is also often used for repair work on viaduct piles, where it is important that the variation in volume of the support concrete is the same as that of the concrete used to carry out the repair work.

Concrete flooring



Self-compacting concrete





## MIX DESIGN

The mix design of concrete is extremely important in order to correctly use **Mapecrete System** and have good results. The factors that need to be taken into consideration for any mix design are maximum water content, the type and amount of cement used, the water/cement ratio and the type of aggregate used. These elements must never be overlooked when designing a concrete mix with the three components of **Mapecrete System**:

### Super-plasticiser

**Dynamon System** is a range of modified acrylic-based admixtures made by Mapei S.p.A. **Dynamon System** allows the amount of mixing water to be considerably reduced and extends workability, depending on each site's particular requirements.

### Expansive agent

**Expancrete** is an expansive agent supplied by Mapei S.p.A. When added to the mix, this powdered admixture reacts with the mixing water and increases overall volume.

### Shrinkage reducing agent

**Mapecure SRA** and **Mapecure SRA 25** are two liquid admixtures supplied by Mapei S.p.A used to reduce drying shrinkage. Laboratory tests have demonstrated that using SRA admixtures reduces drying shrinkage after 28 days up to 50%.

**Mapecrete System** uses the synergic effect of the three single components to increase expansion during the first phase and reduce the effect of shrinkage during the second phase, when the level of relative humidity is that of the surrounding environment. The chart illustrates

the dimensional change measured in the laboratory on concrete specimens of a reference mix, and then on the same mix incorporating **Mapecrete System**.

One of the conditions for **Mapecrete System** to work effectively is that the concrete must always be strengthened using metallic fibres, such as with **Mapefibre Steel**, or with a single or double layer of metallic strengthening mesh. So that the minimum percentage, in terms of ratio between section of rebars and section of concrete, cannot be lower than 0.15%. The expansion induced by the admixtures is restrained by the reinforcement to generate a sort of pre-stressed condition that gradually decreases as drying shrinkage advances. The reduction in the level of internal tensile stresses eliminates the risk of cracking.

## COMPATIBILITY WITH OTHER SYSTEMS

Industrial flooring made using **Mapecrete System** are compatible with various systems of surface treatment. The use of surface hardening (**Mapetop N AR6**), of impregnating consolidating (**Mapecrete Hardener LI**), of water-repellent and thixotropic stain-resistant (**Mapecrete Creams Protection**, **Mapecrete Stain Protection**) is an optional component of the system but it becomes crucial when the achievement of the maximum level of quality and performance is required to the pavement.

The curing of concrete, containing **Mapecrete System**, must be always performed and preferably extended to 10/14 days since the concrete is poured. Performing a correct curing of concrete is crucial to ensure maximum performance of **Mapecrete System**.

The best effect for curing is the wetting method with water floating in addition to polyethylene sheets or burlap to prevent evaporation. Only, if it is not possible (vertical constructions, wind exposure) the using of **Mapecure S**, **Mapecure E** and **Mapecure CA** is recommended.

Once the working process has been finished, the surface of concrete containing **Mapecrete System** can be even treated with special finishing systems based on epoxy and polyurethane resins like **Mapefloor System** or with systems of protection and decoration such as **Mapelastic** and **Elastocolor**.

Edge beam



Slab on viaduct





#### ● **Technical documentation**

From the technical area menu you can view the technical documentation divided per product lines and type of document.

**HEADQUARTERS**  
**MAPEI SpA**  
Via Cafiero, 22 - 20158 Milan  
Tel. +39-02-37673.1  
Fax +39-02-37673.214  
Internet: [www.mapei.com](http://www.mapei.com)  
E-mail: [mapei@mapei.it](mailto:mapei@mapei.it)

