

# KALMATRON KC

KALMATRON®KC - ADMIXTURE TO CEMENT

## ■ INTRODUCTION

- Even the final product of the cement clinker has a lot of foreign inclusions in the frame of the cement structure. During the hydration of Portland cement, approximately 30% of the hydration products form calcium hydroxide, which is also known as a free lime. This has no cementitious value by itself. It is soluble in water and causes powerful conduction of liquids through the concrete body. Therefore, up to 30% of cement in a concrete mix becomes not only useless, but also harmful for concrete durability.
- For a cement particle that measures 50  $\mu\text{m}$  across, the depth of hydration is 4  $\mu\text{m}$  at 28 days and 8  $\mu\text{m}$  after a year. Full hydration has only been obtained by grinding cement in water continuously for five days. The standard average across measurement of a cement particle is over 90  $\mu\text{m}$ .
- KALMATRON®KC was developed as an admixture to cement to increase hydration by molecular decay of unstable relations between foreign inclusions with cement particles. After that, hydration is an entirely completed reaction with higher performance of concrete rheology that obtained many features of High Performance Cements and High Alumina Cements. The lower the grades of cement powder, the higher the effectiveness of KC.

## ■ DESCRIPTION of KC

KC is a gray dry powder with a light specific smell. This non-organic cementitious modifier works as a Cement's Type Upgrading Admixture to enhance the final features of the resulting concrete mix.

## ■ APPLICATION

- Add KC with a 1% ratio to the cement weight (10 Kg of KC per 1000 Kg of cement).
- Mix by using advanced technology for a homogeneous mix.
- Apply the final mix of the cement containing KC using the standard technology.

## ■ USES

- Enhancing of the low-active cements type I;II to get the highest modifications.
- Use KC-cement for concrete used in civil, hydro-technical and fortification structures.
- Early strengthening and waterproofing of the ready mixed concrete and mortar.

## ■ BENEFITS FOR CONCRETE APPLICATION

- Reduces dosage of water in the Water-Cement ratio at 10 to 20% and more.
- Reduces the amount of Cement needed by at least 15 to 25% and still obtain the conventional concrete mix.
- Increases compressive strength at 25% and more.
- Increases impermeability 2 to 4 times and reduces exothermic heat up to two times.
- Increases Density, Reduces Shrinkage & Accelerates Early Strength.
- Improves resistance of Sulfate, Acid, and Petroleum Corrosions.
- Increases Freeze/Thaw durability.
- Increases Yield of the ready mix concrete by 3% to 6%.

## ■ TRANSFORMATION OF PORTLAND CEMENT BY USING KC ADMIXTURE

As it is known, the production or enhancement of the high quality Portland cements is expensive because of fine grinding, long term burning in kiln, cooling, etc. Application of KC is as simple as mixing with the cement during the last stage of the standard technology. Selective test of pre-admixed KC with the worst cement in the plant will result in a highly modified type of cement in accordance with ASTM classification.

## ■ VARIETY OF KC APPLICATION

Depending on the initial cement quality, the results of selective test in a laboratory may vary. The lower grade of local cement, the better KC will perform.

Type I + KC  $\Rightarrow$

ASTM Types	Enhancing of Type I up to modification of:
Type II	Modified Portland
Type III	Rapid Hardening, High Strength
Type IV	Low Heat Portland
Type V	Sulfate Resistance
Special Types	High Alumina Cement

Before testing, please inform us about the mineralogical content of the original cement. This is necessary to get a successful selection of the needed dosage and stable quality of application.