

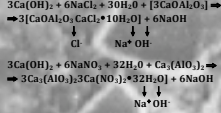


# KALMATRON KF-SEA

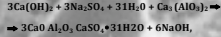
## Changes of the crystal phase:

$Am Bn \rightarrow mA + nB$ ;  
 $Ca(OH)_2 \rightleftharpoons CaOH^+ + OH^-$  - dissipation of alite  
 $NaCl \rightleftharpoons Na^+ + Cl^-$  - dissipation of salt  
 $Ca(OH)_2 + Cl^- + aq \rightleftharpoons CaOHCl aq [Ca(OH)_2 \cdot CaCl_2 \cdot H_2O]$   
 $Ca(OH)_2 \cdot CaCl_2 \cdot 12H_2O$  - hydroxochlorides, So:  
 $Cl^- \rightarrow NO_3^- \rightarrow SO_4^{2-}$   
 $Ca_2SiO_4 \rightleftharpoons 2Ca^{2+} + SiO_4^{4-}$  - dissipation of belite  
 $CaO + H_2O \rightleftharpoons Ca(OH)_2$   
 $Ca(OH)_2 + NaNO_3 \rightleftharpoons \downarrow Ca(OH)NO_3 + NaOH$   
 $Ca(OH)_2 + Na_2CO_3 \rightleftharpoons \downarrow CaCO_3 + 2NaOH$   
 $Ca(OH)_2 + Na_2SO_4 \rightleftharpoons \downarrow CaSO_4 + 2NaOH$   
 $Ca(OH)_2 + NaCl_2 \rightleftharpoons \downarrow Ca(OH)Cl_2 + NaOH$

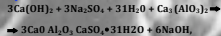
## Tricalciumaluminate



## Hydronitrataluminate



## Hydroxochloraluminate



## After 30d 200, 6.5 and

## Residue 8.1, 10.5, 11.5

Dissolubility of belite in a water is known as

$B = 4.00 \times 10^{-4} \text{ mole/dm}^3$

Dissolubility of belite in 10% of NaCl-w/s is

$P = 0.01 \text{ mole/dm}^3$

## INTRODUCTION

- KALMATRON® KF-SEA is an admixture to the regular concrete mixes containing unwashed sea-sand and sea- gravel where hydration of cement may be provided with sea- water as well.
- Gray powder with specific smell. After application the smell disappears. The non-organic cementitious compound discharge electrochemical potential of the most sea-salts that are aggressive to the concrete structure.

## RECOGNITION OF KALMATRON® KF-SEA

- KALMATRON® KF-SEA performs the best concrete quality being in the same environment where raw materials were taken from.
- Before any operation in a new market place, it is necessary to determine which of the dosage from 12 Kg/m<sup>3</sup>, or 14 Kg/m<sup>3</sup>, or 16 Kg/m<sup>3</sup> is the best in comparative compressive strength testimony.

## USES OF KALMATRON® KF-SEA

- Used for enhancing of concrete and reinforced concrete in the centrally loaded foundations, pillars, walls, columns, etc. except for bending elements with thickness less than 450 mm.
- Facilities for Industrial and Military hazardous wastes, dams, tunnels, heavy traffic roads, ramps, seaports, airports, etc.

## BENEFITS FOR CONCRETE STRUCTURES

- Used with natural and unwashed sea-fillers for higher durability than any known HP concrete mixes.
- Absolute resistance to salt corrosion of concrete structure with preventing of the metal anchors and rebar rusting as well.
- Highest liquid impermeability, resistance to vapor transmission, and advanced as radiation shielding material.
- Reduces exothermic heat up to two times.
- Highly resistant to chemical corrosions and Freeze/Thaw cycles.
- Stable resistance to the core efflorescence.
- Mortars with KF-SEA are very adhesive to concrete and granite.

## BENEFITS FOR CONCRETE APPLICATION

- Workable with reduced Water-Cement ratio at 10 to 20%.
- Increases compressive strength at 35% and more.
- Increases Density, Reduces Shrinkage & Accelerates Early Strength.
- Increases Yield of the ready mix concrete by 8%.

## ECONOMICAL ADVANTAGES

- Absolute independence from suppliers of the sand, gravel, and water. Take them from sea- shore.
- Facilities for Industrial and Military hazardous wastes, dams, tunnels, heavy traffic roads, ramps, seaports, airports, etc.
- No other chemicals applied with KF-SEA.
- Cost of ready mix concrete with KF-SEA drops at 40% in comparison with salt resistant HP concrete and at 25% with conventional one.

## THE ESSENTIAL OF KALMATRON® KF-SEA

- Appearance of concrete/mortar structures with KF-SEA is different from the known. Compaction with density at 2,400 Kg/m<sup>3</sup> to 2,700 Kg/m<sup>3</sup> is visually close to be determined as an artificial rock.
- Dark or black- gray color of concrete structure is an indication of complete mineralogical oxidation, or so- called Ironing of Concrete.

