



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
 $Ca(OH)_2 + Cl^- + aq \rightleftharpoons CaOHCl aq [Ca(OH)_2 \cdot CaCl_2 \cdot H_2O]$
 $Ca(OH)_2 + CaCl_2 \cdot 12H_2O \rightleftharpoons$ - hydroxochlorides, So:
 $Cl^- \Rightarrow NO_3^- SO_4^{2-}$
 $Ca_2SiO_4 \rightleftharpoons 2Ca^{2+} + SiO_4^{4-}$ - dissipation of belite
 $CaO + H_2O \rightleftharpoons Ca(OH)_2$
 $Ca(OH)_2 + NaNO_3 \rightleftharpoons Ca(OH)NO_3 + NaOH$
 $Ca(OH)_2 + Na_2CO_3 \rightleftharpoons CaCO_3 + 2NaOH$
 $Ca(OH)_2 + Na_2SO_4 \rightleftharpoons CaSO_4 + 2NaOH$
 $Ca(OH)_2 + NaCl_2 \rightleftharpoons Ca(OH)Cl_2 + NaOH$

Tricalciumaluminochloride
 $3Ca(OH)_2 + 6NaCl + 30H_2O + [3CaOAl_2O_3] \rightleftharpoons$
 $\rightleftharpoons [3CaOAl_2O_3 \cdot CaCl_2 \cdot 10H_2O] + 6NaOH$
 $\downarrow \quad \downarrow$
 $Cl^- \quad Na^+ OH^-$
 $3Ca(OH)_2 + 6NaNO_3 + 32H_2O + Ca_3(AIO_3)_2 \rightleftharpoons$
 $\rightleftharpoons 3Ca_3(AIO_3)_2 \cdot 3Ca(NO_3)_2 \cdot 32H_2O + 6NaOH$
 $\downarrow \quad \downarrow$
 $Na^+ OH^-$

Hydronitratoluminate
 $3Ca(OH)_2 + 3Na_2SO_4 + 31H_2O + Ca_3(AIO_3)_2 \rightleftharpoons$
 $\rightleftharpoons 3CaO Al_2 O_3 \cdot CaSO_4 \cdot 31H_2O + 6NaOH$

Hydroxochloraluminates
 $3Ca(OH)_2 + 3Na_2SO_4 + 31H_2O + Ca_3(AIO_3)_2 \rightleftharpoons$
 $\rightleftharpoons 3CaO Al_2 O_3 \cdot CaSO_4 \cdot 31H_2O + 6NaOH$

Alite: 3CaO (80), C3S and Belite: 2CaO (20), C2S
 Dissolubility of belite in a water is known as $P = 1000 \cdot \frac{m}{d}$
 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/m³, or 14 Kg/m³, or 16 Kg/m³ 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/m³ to 2,700 Kg/m³ 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.

