

## **CA-FR3L**

### **LIQUID DISPENSANT**

#### **DESCRIPTION**

CA-FR3L is a dark amber liquid with a specific gravity of 1.2 for use as a high molecular weight friction reducer/dispersant for cement slurries. CA-FR3L enables the preparation of low viscosity / high turbulence slurries with improved cement uniformity.

#### **MAJOR ADVANTAGES**

The use of CA-FR3L friction reducer/dispersant in cement slurries offers advantages, which can be summarized under the following categories:

**CEMENT COMPATIBILITY** - CA-FR3L is compatible with practically all standard API cement classes including Class A,C,G, and H.

**ADDITIVE COMPATIBILITY** - CA-FR3L is fully compatible with Extenders, Retarders, and Accelerators including CA-R4, CAEX2, and CA-R5.

**MIX WATER - SLURRY VISCOSITY** - Both freshwater and low salinity sea water (less than 18%) can be prepared with CA-FR3L.

**SLURRY UNIFORMITY** - The dispersive action of CA-FR3L effectively reduces slurry viscosity, enabling a smoother slurry to be prepared.

**TURBULENCE INDUCTION** - Cement homogeneity is increased due to CA-FR3L's ability to prevent uneven particle coagulation.

**DRILLING FLUID REMOVAL** - The attainment of turbulent flow in the annulus at lower pump rates improves drilling fluid removal, prevents channeling, and enhances slurry "bonding" capability.

**CONCENTRATION** - CA-FR3L is used in very low concentrations, normally 0.05 to 0.30 gal per sack of cement.

**COMPRESSIVE STRENGTH** - The improved dispersion of cement particles in CA-FR3L prepared slurries enables improved strength development.

**CEMENT DENSITY** - CA-FR3L allows the preparation of high density slurries, by reducing the water/cement ratio, while maintaining slurry pumpability. This phenomenon increases compressive strength development, decreases cement permeability, and in certain cases, can result in a direct cost savings, as a weighting agent may not have to be used in order



to achieve a specific slurry density.

## APPLICATIONS

The friction reducing and dispersion characteristics of CA-FR3L enable its application in a wide variety of cement operations, including Primary Cementing, Liner Cementing, Cement Plugs and Squeeze Cement Operations.

In the cases of large casing O.D/hole diameter ratio primary cementing operations, the use of CA-FR3L will enable turbulent flow to be achieved with minimal pump rate, thereby enabling improved drilling fluid removal, bonding and cement homogeneity.

Where a high strength Cement Plug is to be set (i.e., for well kick-off, or sidetracking), the use of CA-FR3L enhances cement particle distribution in the slurry enabling a stronger more homogenous plug to be formed.

If narrow I.D. tubing is to be used in a particular cementing operation, CA-FR3L will considerably reduce friction pressure, and hydraulic horsepower requirements.

## CONCENTRATION

CA-FR3L is normally used in concentrations of 0.01 to 0.30 gal per sack of cement. In the case of fly ash cements, the correct amount of CA-FR3L required is calculated on the combined weight of cement plus fly ash.

The attached tables illustrate the change in compressive strength values that can be achieved with CA-FR3L. It should be noted that these tables are not intended for specific slurry design, as actual values may differ depending on specific applications. It is recommended that prior to usage CA-FR3L be pilot tested with the known mix water, cement type, and any other cement additives in order that accurate concentration requirements can be determined.

## RECOMMENDED TREATMENT

CA-FR3L should be prepared in the slurry mix water prior to commencing the cement operation.

The following guidelines are recommended:

- The rig mix water pit should be thoroughly cleaned and all gates and valves checked for leaks.
- The mixing pump, suction lines, and discharge lines should be thoroughly flushed to ensure complete removal of all drilling fluid sludge.



- The required volume of cement mix water, plus 10-20% excess should be treated with the design rate of CA-FR3L. Thus, if additional mix water is needed, it has all the required additives in correct proportion.
- The required amount of CA-FR3L should be added slowly to the pit, with all agitators and gun lines operating, to ensure thorough mixing. Recommended mixing rate for CA-FR3L is 5 minutes per can. Care should be taken that the exact concentration per barrel of mix water is added.
- Any other additives should also be mixed at this time.
- When all additives have been mixed, the mix water should be left continuously agitating and circulating to ensure all products are fully and evenly dispersed in the mix water.

## SAFETY

When handling CA-FR3L, goggles should be worn at all times as eye contact can result in some irritation. In case of eye contact, flush eyes with water for not less than 15 minutes. If irritation persists, seek qualified medical attention. If skin contact occurs, wash thoroughly with water. If ill effects continue, seek medical attention.

## PACKAGING

CA-FR3L is packaged in 5-gallon cans and 55-gallon drums.

