

## **CA-FR3P**

### **CEMENT DISPERSANT/FRICTION REDUCER**

#### **DESCRIPTION**

CA-FR3P is a free-flowing powder with a specific gravity of approximately 1.57. CA-FR3P acts as a friction reducer/dispersant for hard to mix cements or for reduced water slurries permitting ease of slurry preparation and pumping operations. The color of CA-FR3P varies from light buff to brown due to the color of the raw materials selected for the manufacturing process. Although the color varies, the quality of raw materials used for CA-FR3P are carefully tested to insure uniform product performance.

#### **ADVANTAGES**

The use of CA-FR3P friction reducer/dispersant in cement slurries offers advantages, which can be summarized under the following categories:

- **Cement Compatibility** - CA-FR3P is compatible with practically all standard API cement classes including Class A, C, G, and H.
- **Additive Compatibility** - CA-FR3P is fully compatible with extenders, retarders, and accelerators including CA-R4, CA-EX2, and CA-R5.
- **Mix Water** - Both freshwater and low salinity seawater (less than 18%) can be prepared with CA-FR3P.
- **Slurry Viscosity** - The dispersive action of CA-FR3P, effectively reduces slurry viscosity, enabling a smoother slurry to be prepared.
- **Slurry Uniformity** - Cement homogeneity is increased due to CA-FR3P's ability to prevent uneven particle coagulation.
- **Turbulence Induction** - Due to the increased fluidity of CA-FR3P prepared slurries, turbulent flow can be achieved at much lower pump rates.
- **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-FR3P is used in very low concentrations normally 0.5% - 1.5% by weight of cement.



- Compressive Strength - The improved dispersion of cement particles in CA- FR3P prepared slurries enables improved strength development.
- Cement Density - CA-FR3P 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 saving, as a weighting agent may not have to be used in order to achieve a specific slurry density.

## APPLICATION

The friction reducing and dispersion characteristics of CA-FR3P 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-FR3P 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-FR3P 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-FR3P will considerably reduce friction pressure, and hydraulic horsepower requirements.

## CONCENTRATION

CA-FR3P is normally used in concentrations of 0.5% to 1.5% by weight of cement. In the case of extended cements, the correct amount of CA-FR3P required is calculated on the combined weight of cement plus extender. The attached tables illustrate the change in compressive strength values that can be achieved with CA- FR3P. 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-FR3P 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-FR3P can be pre-blended with bulk cement or prepared in the slurry mix water prior to commencing the cement operation. In the case of dry blending, care should be taken to ensure that all the CA-FR3P is evenly distributed within the cement and sufficient time allowed for this process.



Where the CA-FR3P is to be mixed into the slurry mix water 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 should be added to the pit allowing at least 20% - 30% excess in the case of problems or emergencies.
- The required amount of CA-FR3P should be added slowly to the pit, with all agitators and gun lines operating, to ensure thorough mixing. Recommended mixing rate for CA-FR3P is 10-15 minutes per sack. 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 AND HANDLING

The following safety precautions should be followed when handling CA-FR3P:

- 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.

Dust masks should be worn when mixing CA-FR3P. In the event that dust is inhaled, move immediately into fresh air. If ill effects continue, seek medical advice.

**PACKAGING** CA-FR3P is packaged in 50 lb (USA) and 25 kg (Europe, Africa and Middle East) export quality sacks.



**COMPRESSIVE STRENGTHS OF VARIOUS CEMENT CLASSES  
WITH 1% CA-FR3P**

CLASS "A" CEMENT COMPRESSIVE STRENGTH, PSI

CURING TIME	95° F (35° C)	140° F (60° C)	170° F (77° C)
8 HRS	420	3950	2890
24 HRS	5000	8000	6100

CLASS "G" CEMENT COMPRESSIVE STRENGTH, PSI

CURING TIME	110° F (43° C)	140° F (60° C)	170° F (77° C)
8 HRS	1200	3300	3900
24 HRS	6000+	6000+	6000+