

INFORMATION

CA-FA1

CEMENT FOAMING AGENT

DESCRIPTION

CA-FA1 is an amber-colored, anionic foaming agent for production of foam cement. CA-FA1 has a specific gravity of 1.07, a density of 8.92 and a flash point of >200° F.

APPLICATION

CA-FA1 allows the creation of stable foam cements with downhole densities as low as 6.0 ppg from a base cement slurry of 14-16 ppg. Foam cements of 9.0 ppg or greater typically exhibit compressive strengths greater than 1000 psi and permeabilities less than 0.1 mDarcy.

Foam cements have demonstrated superior bonding characteristics. The expansive (compressed) nature of foam cements prevents the formation of a micro-annulus while the high yield points inherent to foam cements provide excellent mud displacement.

Foam cements offer an economical and effective means to place lightweight high strength cement across weak, easily fractured formations or areas of massive lost circulation that will not support conventional cements. The proper use of foam cement can eliminate the need for stage collars or, in some instances, entire casing strings. Also in cementing operations requiring large volumes of cement, foam cement can be the least expensive method of cementing - nitrogen is a very inexpensive cement extender.

Messina also offers a foamed cement spacer, please refer to CA-FSP1 for information.

RECOMMENDED TREATMENT

CA-FA1 is recommended at the rate of 0.75% by weight of unfoamed slurry.

Example:

16.0 ppg unfoamed cement slurry
4 Barrels per minute (BPM) mixing rate
8.92 density of CA-FA1

A.

$16.0 \text{ ppg cem} \times 42 \text{ gal/bbl} \times 0.75\% \text{ CA-FA1} = 8.92 \text{ ppg}$
0.565 gal CA-FA1/BBL of unfoamed cement

B.

$0.565 \text{ gal CA-FA1/BBL} \times 4 \text{ BPM} =$
2.26 gal CA-FA1/min injection rate

The 2.26 gal/min injection rate for CA-FA1 is correct only for a mixing rate of 4 BPM; therefore, if the mixing rate changes, so must the CA-FA1 injection rate. CA-FA1 is injected into the cement pump trucks suction manifold (slurry supercharger) from a complexing trailer and the CA-FA1 mixes with the cement while passing through the pumps. The CA-FA1 cannot be added to the cement mix water as uncontrolled foaming will interrupt mixing.

All foam cement job designs should incorporate either a "cap" slurry or be shut-in under 500 psi back pressure to insure proper density and well control. A good, tested BOP is essential for any foam cement job.

Small additions of either CA-FL7, CA-FL8, or CA-EX5 are recommended as a foam stabilizing agent and an additional 4% (by weight of cement) mix water is usually required to control the viscosity of the foamed cement.

COMPATIBILITY

Although 0.1-0.2% CA-AFL defoamer and 3-5% KCl or NaCl are regularly used and recommended with CA-FA1, high concentrations of these products should be avoided as they reduce the effectiveness of CA-FA1. While CA-FA1 is compatible with all other commonly used cement additives, good engineering practices dictate that all foam cement designs be thoroughly tested in the laboratory to insure proper performance. Typically a foamed cement will vary little in thickening time but will have improved fluid loss control when compared to the base slurry.

SAFETY

Contact with eyes and skin should be avoided. Goggles and gloves are recommended for handling. Use only with adequate ventilation. Do not take internally.

PACKAGING

CA-FA1 is shipped in lined steel drums containing 52 gallons.

CA-FA1 is a Messina trademark