

CA-EX5

CEMENT EXTENDER

DESCRIPTION

CA-EX5 is a fine bentonite clay powder used to extend a cement slurry to reduced densities without water separation. Referred to as "gel" in oil-field applications, CA-EX5 also reduces the fluid loss and helps to suspend larger fines (solids) in a cement slurry. At concentrations of 6% CA-EX5 (or higher) BWOC, a dispersant may be required to prevent excessive viscosity. Its typical properties are:

Form:	Tan powder
Specific Gravity:	2.65 + 0.03
Bulk Density (lb/cu ft):	60

APPLICATION

CA-EX5 is used in concentrations up to 25% by weight of cement. The slurry viscosity will increase with increasing CA-EX5 concentration. At concentrations above 6% BWOC, a dispersant such as CA-FR3P or dispersant/retarder such as CA-R1 or CA-R2 may be required to mix the slurry properly. Salt may also be used to aid in mixing. Advantages of CA-EX5 cement slurry are:

- 1) Reduced Slurry Density - Because CA-EX5 absorbs about 5.3% water for each 1% CA-EX5, lightweight slurries can be formulated with no water separation.
- 2) Improved Fluid Loss Control - Although not as effective as CA-FL additives, CA-EX5 helps to reduce the extent of formation damage caused by fluid leak-off. The addition of 8-12% CA-EX5 will cut fluid loss to about 50% of neat cement slurries.
- 3) Prolonged Suspension of Solids - The increased viscosity imparted by CA-EX5 permits complete support of additives such as aggregates used for lost circulation (CA-LC10).

Addition of CA-EX5 to a cement slurry usually results in a decrease in compressive strength development and a slight increase in the permeability of the set cement.



MIXING

CA-EX5 is dry blended with the cement. The CA-EX5 will continue to impart viscosity to a cement slurry as it is pumped downhole.

See Tables for CA-EX5 following.

TYPICAL SLURRY DESIGNS
API - CLASS G CEMENT

<u>%</u> <u>CA-EX5</u>	<u>SLURRY DENSITY</u> <u>PPG</u>	<u>YIELD</u> <u>CU FT/SACK</u>	<u>MIX WATER</u> <u>GAL/SACK</u>
0	15.8	1.14	4.97
2	15.0	1.31	6.17
4	14.4	1.48	7.36
6	13.9	1.65	8.56
8	13.5	1.82	9.76
12	12.7	2.16	12.15
16	12.3	2.51	14.55
20	11.9	2.85	16.94

TYPICAL COMPRESSIVE STRENGTH

<u>%</u> <u>CA-EX5</u>	<u>COMPRESSIVE STRENGTH, psi</u>	
	<u>100° F</u> <u>24 HOURS</u>	<u>200° F</u> <u>24 HOURS</u>
4	975	2310
8	550	2100
12	340	1760
16	200	1450
20	120	1100

