

INFORMATION

CA-R4

LOW TO MEDIUM TEMPERATURE CEMENT RETARDER

DESCRIPTION

CA-R4 is a free-flowing, dark powder and a premium quality organic cement retarder for use with neat or low gel content slurries. CA-R4 is compatible with all API cements and pozzolan cement.

APPLICATION

CA-R4 can be utilized in a variety of cementing operations where higher temperatures are encountered. CA-R4 has applications in Primary Cementing (i.e. long string casing and intermediate casing), Cement Plugs, and Squeeze Cementing.

CA-R4 has been successfully used to retard cement slurries in wells up to 14,000 ft deep.

MAJOR ADVANTAGES

The application of CA-R4 cement retarder provides the following advantages:

CEMENTS: CA-R4 is fully compatible with all API cements and cements blended with pozzolans.

MIX WATER: CA-R4 can be used in fresh and seawater slurries.

FREE FLOWING: Ensures smooth, lump-free blending of cement slurries.

TEMPERATURE: CA-R4 will effectively retard cement slurries in wells with temperatures up to 220° F (104° C) BHCT.

CONCENTRATION: CA-R4 is extremely cost effective, as only small concentrations are required (i.e. normally 0.1% to 0.7%).

COMPRESSIVE STRENGTH: CA-R4 does not appreciably alter final cement compressive strength.

CONCENTRATION

CA-R4 is used in extremely small concentrations, usually less than 1% by weight of cement. Reference to the attached table illustrates approximate thickening times and compressive strengths at differing concentrations of CA-R4. These tables serve to illustrate examples, and should not be used as a direct concentration reference.

Lab testing should always be carried out so that accurate slurry behavior can be determined using the particular cement and mix water for a specific cementing operation.

Where CA-R4 is used in Pozzolan cements, the concentration is calculated on the combined weight of cement and pozzolan.

RECOMMENDED TREATMENT

CA-R4 can be dry-blended or mixed with the slurry mix water prior to cementing. The following procedure should always be followed when mixing additives in the slurry mix water.

- Ensure the rig mixing tank/pit is fully flushed and cleaned, and that all valves and gates are fully checked.
- The centrifugal pump and associated suction and discharge lines should also be thoroughly cleaned to avoid contamination of the mix water by residual drilling mud.
- The pit should be checked for accurate capacity calculations and filled with the type of mix water required.
- The required amount of CA-R4 should be added at a rate of 10-15 minutes per sack, to ensure full dispersion.
- The mix water should be left to circulate and agitate several hours prior to cementing.

SAFETY

Normal safety precautions should be followed when handling CA-R2. Goggles and face masks should be worn to prevent unnecessary eye contact and inhalation. If eye contact does occur, wash thoroughly for a period of not less than 15 minutes.

PACKAGING

CA-R4 is packaged in 25 kg or 50 lb export quality sacks.

CA-R4 is a Messina trademark

CONCENTRATION OF CA-R4 VS THICKENING TIME FOR CASING CEMENTATION
(Class G Cement)

PERFECT CA-R4	WELL DEPTH (FT)	TEMPERATURE °F (BHCT)	THICKENING TIME (HRS)
0	2,000 - 4,000	78-169	2-4
0.2	4,000 - 7,000	170-229	2-3
0.4	7,000 - 10,000	230-289	3-4
0.6	10,000 - 14,000	144-220	3-5

COMPRESSIVE STRENGTH (psi) CLASS G CEMENT (15.8 ppg)

PERFECT CA-R4	CURING TEMP (150 °F)			CURING TEMP (180 °F)		CURING TEMP (225 °F)	
	8 HR	12 HR	24 HR	8 HR	24 HR	8 HR	24 HR
0	1300	2450	3250				
0.2	725	1900	2850	1450	3200		
0.4	480	1260	2400	1200	2850	1830	3725