INFORMATION

CA-GS1

GAS STOP CEMENT ADDITIVE

DESCRIPTION

CA-GS1 (GAS STOP) is a liquid matrix intensifier which effectively controls annular gas migration and fluid migration into a cement column at wellbore temperatures up to 400° F (200° C). A highly refined copolymer blend, CA-GS1 bonds cement molecules together to create an impermeable matrix in the liquid, semi-solid, and solid cement sheath around the wellbore.

CA-GS1 is compatible with all Classes of API cement and most cement additives. For best results, the use of Messina's CA-FR3P or CA-FR3L (Dispersants) is recommended for all GAS STOP cement slurry formulations:

Form	Viscous Yellowish Liquid
Specific Gravity	1.10
Absolute Volume	0.0 gal/lb

APPLICATION

CA-GS1 can be used in all types of primary cementing applications to impart excellent fluid loss control to the cement slurry and/or control the migration of unwanted gas or fluid into the cement column. CA-GS1 is typically added to the cement slurry at concentrations ranging from 15% to 25% BWOW. In most operations, 15% BWOW is optimum.

CA-GS1 has been used very effectively to control gas migration in well having BHCT's up to 400° F (200° C). As with all cement slurry designs for critical wells, laboratory testing is advised to make sure the slurry properties (i.e. rheology, pumping time, and setting time is ideal), and will maintain for the duration of the cementing application.

For best results, a minimum of 500 ft of cement slurry should be placed above the gas zone. Also, a minimum of 300 ft should be placed below the gas zone. When liner cementing is scheduled, the entire cement column should contain the CA-GS1 additive to ensure the desired results.

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CA-GS1 is compatible with all Classes of API cement and most cement additives. The use of CA-FR3P or CA-FR3L is advised to improve the efficiency and economics of the GAS STOP cement system.

The pumping time of the GAS STOP system should be designed as close to the actual job time as possible. The CA-GS1 slurry should have no free water and, the system must not gel up under static or low shear conditions. CA-GS1 is added to the mix water on location.

Laboratory testing of CA-GS1 slurries is advised for all high temperature applications.

DISCUSSION

Annular gas flow has long been a source of safety and operational problems as well as a severe detriment to gas production from high pressure reservoirs. The movement of high pressure gas into the wellbore annulus and through a cement column to the surface can endanger the drilling rig and rig personnel, plus cost unnecessary delays and expense in drilling and/or completing a well.

Also, interzonal communication between zones can attribute to irretrievable loss of reserves and over-pressurization of shallow sands.

The pathways for annular gas flow are primarily along the cement/casing and cement/formation interfaces, but can also exist in the matrix of the cement column. Annular gas flow through the cement column occurs during the setting or "transition period" of the cementing process. During this period, the cement column becomes essentially self-supporting or semi-solid which relieves the hydrostatic pressure on the gas zone normally exerted by the cement column.

However, the cement column is not set to the point where gas cannot penetrate the matrix or push a channel (micro-annulus) up through the outer boundaries of the cement sheath.

When the pore pressure of the cement drops below the pore pressure of the gas reservoir; due to loss of interstitial water; rate of hydration of the cement; or decline in hydrostatic pressure; the potential for gas or fluid migration into the cement column is created.

Before any cement additive or cement system can effectively control the flow of gas at the interfaces or into the cement matrix,gs proper planning and good cementing practices must be employed into the cementing procedure. Proper mud conditioning and complete mud displacement prior to cement application is imperative as undisplaced drilling mud provides an easy access for gas migration along the interfaces. This is predominant in deviated wellbores.

The cement slurry must have excellent slurry properties. The system must be designed to contain a minimum amount of gellation until set occurs. Slurry properties must be maintained during the entire application thus, loss of water at the cement shoe or into thief zones cannot be tolerated. CA-GS1 (GAS STOP) imparts extremely excellent fluid loss control to cement slurries. In addition, Messina's CA-GS1 ties up the water in the matrix of the cement column and surrounding the cement column by creating a network of elastic bonds which intensify the matrix and seal the cement to the casing and formation inhibiting gas flow during the setting process.

OPTIONAL GAS STOP ADDITIVE

Messina's CA-LX2L (Liquid Latex) can also be used to prepare a high quality GAS STOP cement for applications at wellbore temperatures up to 212° F (100° C). The use of Messina's CA-FR3P or CA-FR3L (Dispersants) is required for slurry preparation.

The addition of CA-FL13L (Fluid Loss Additive) will also greatly enhance the efficiency of the latex GAS STOP cement slurry.

Typical CA-LX2L concentrations for effective gas control range from 1.5 to 2.5 gal per sack of cement. The total mix fluid volume must exceed 4.5 gal per sack of cement for GAS STOP slurry design using CA-LX2L. Laboratory testing of all CA-LX2L systems used for gas migration control is recommended.

HANDLING

CA-GS1 is viscous and can become hard to handle and properly deliver at temperatures below 50° F. Care should be taken during transport and storage to assure that the liquid will not become to viscous to use on location.

GA-GS1 will suffer some degree of phase separation if stored over a long duration. The liquid is easily re-dispersed by rolling or agitating prior to adding to the mix water.

PACKAGING

CA-GS1 is packaged in 55 gal drums 5 gal plastic pails.

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