IsoBond™ Cement System

MITIGATING SUSTAINED CASING PRESSURE BY MANAGING GAS MIGRATION AND ANNULAR FLOW

OVERVIEW

Sustained casing pressure (SCP) affects more than 30% of wells globally. This is caused by flow mechanisms such as gas migration or annular flow through unset cement, mud channels, and cement permeability. When SCP occurs, it is an indication that well integrity has been compromised, which can have an impact on wellbore isolation, emissions, and well production.

Mitigating SCP starts with selecting the right cement barrier. Because SCP is often caused by a combination of flow mechanisms, it can be difficult to identify why it occurs. The IsoBond™ cement system proactively and economically mitigates SCP at its source, on all fronts, by delivering a barrier that minimizes fluid loss, shortens transition time, improves shear bonding, and reduces permeability.

MINIMIZE FLUID LOSS TO THE FORMATION

The IsoBond cement system provides tight fluid loss control of 50 cc per 30 minutes or less for applications up to 250°F. Tight fluid loss control helps to ensure successful placement of the cement slurry across challenging formations – and to also mitigate annular flow through unset cement by reducing the volume of losses created by the loss of filtrate from the cement slurry.

Many slurries are designed to mitigate against fluid loss, but fluid loss is just one of the contributing factors. The inability of the cement column to maintain overbalance during the transition time, combined with fluid loss, is the most widely accepted cause for annular gas or fluid migration through unset cement.

SHORTEN TRANSITION TIME OF THE CEMENT SLURRY

The IsoBond cement system provides a transition time of less than 30 minutes, which helps to mitigate the potential for gas or fluid flow through the cement slurry. After placement, the cement starts to build gel strength until it is no longer transmitting hydrostatic pressure to the annulus below, which often leads to a loss of overbalance pressure. This loss in overbalance pressure leaves the unset cement susceptible to gas and fluid flow through the unset cement. The IsoBond cement system builds gel strength rapidly, and this short transition time reduces the risk of gas or fluid influx, thereby reducing the risk of sustained casing pressure due to flow through unset cement. The system's rapid gel strength development can also help create effective zonal isolation in challenging wellbores.

HIGHLIGHTS

- Provides excellent fluid loss control
- Shortens the transition time of the cement slurry
- Improves shear bonding
- Offers reduced permeability for increased resistance to degradation
- Provides an operationally efficient dry blended system that is effective up to 250°F

IMPROVED SHEAR BONDING

The IsoBond cement system can deliver over a 40% increase in the anchoring force that the cement has to the casing and formation. This results in a cement sheath that is more crack resistant and that can better withstand the downhole forces encountered during the life of the well. Additionally, the increased anchoring capability of IsoBond cement supports zonal isolation and prevents debonding that can create a flow path for fluids or gases to migrate up the annulus.

REDUCED PERMEABILITY

The IsoBond system has been developed to reduce cement permeability by up to 75% compared to similar cement systems. Higher permeability cement is more susceptible to corrosive fluids and gases that can lead to degradation of the cement sheath. The reduction in permeability that IsoBond cement provides results in a cement sheath with increased resistance to degradation from corrosive fluids. IsoBond cement also has less susceptibility to gas influx, and has proven to be a more dependable barrier to gas migration and annular flow for long-term integrity.

OPERATIONALLY EFFICIENT

The enhanced cement properties that the IsoBond cement system delivers are comparable to the benefits often achieved by utilizing latex or other premium liquid additives. The IsoBond system is a dry blended cement that provides more significant operational efficiencies for land operations compared to systems that require liquid additives. By eliminating the additional equipment and requirements needed for liquid additives, and by utilizing the IsoBond cement system, operators can achieve a more efficient, sustainable, and economical cement solution.

ISOBOND™ CEMENT SYSTEM + CHANNELFIX™ ADDITIVE FOR IMPROVED ZONAL ISOLATION AND ELASTICITY

As stated earlier, the IsoBond cement system helps to mitigate gas migration and annular flow by minimizing fluid loss, shortening the transition time, improving shear bonding, and reducing permeability. However, poor mud removal can compromise isolation and allow pathways for gas and fluids to migrate in the annulus. When the IsoBond cement system is paired with the ChannelFix™ cement additive, it provides the additional assurance of a dependable barrier, even when mud removal has been compromised. Through contact with an oil-based mud (OBM), a synthetic-based mud (SBM), or produced well hydrocarbons, the ChannelFix cement additive will swell to help fill the pathways and create a dependable cement barrier. This additive not only helps to seal channels of residual OBM, but also increases the elasticity of the cement sheath – thus providing higher resistance to cyclical loading and improving long-term isolation.

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Test Type	Liquid Latex Cement Design	IsoBond™ Cement System
API Fluid Loss at 180°F (cc/30 min)	20 cc	10 cc
MACS II® Cement Analyzer Static Gel Strength (SGS) Transition Time	58 min	25 min
Shear Bond	130 psi	284 psi
Permeability	0.096 µd	0.022 µd

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com

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