

Baroid Fluid Services

FUSE-IT™

Lost Circulation Treatment

Loss of circulation can be costly and difficult to control. Severe losses can disrupt drilling operations for days. The fast-acting, synthetic polymer-based FUSE-IT™ lost circulation material helps seal off even the most severe loss zones in as little as 30 minutes and can allow the operator to return to normal drilling activities.

FUSE-IT system is for applications where the following conventional lost circulation materials (LCM) have failed (or are anticipated to fail) in the function of restoring drilling fluid circulation:

- Sized particles
- Fibers
- Super-absorbent, swelling polymer crystals
- Crosslinkable polymer systems

FUSE-IT System

- Is suitable for both onshore and offshore applications and can be pumped straight from totes by the use of a conventional cementing unit with mixing tank and manifold. No cement blending unit is needed.
- Is chrome-free, yet can provide significant advantages over other options for severe lost circulation. FUSE-IT lost circulation material does not crosslink. This new application of synthetic polymers can achieve effective formation sealing properties without the addition of clays or other inorganic materials.
- Can be applied when either water-based or non-aqueous (inverse emulsion) fluids are in the wellbore. The product can be applied unweighted, or at densities up to 20 lb/gal for both water-based and non-aqueous fluid applications.
- Will not set-up on surface. After the pill is placed downhole, it reacts instantaneously with water, most water-based muds, and sodium chloride brines to create a competent, cohesive seal.



HAL17803



HAL17802

FUSE-IT system added to lignosulfonate mud sample in a 1:20 ratio.

- Is temperature tolerant and applicable at downhole conditions from mild to in excess of 400°F.
- Is suitable for healing losses under many types of conditions:
 - Highly fractured or depleted formations
 - Vugular or cavernous formations
 - Cementing and squeeze operations
 - Interwell communications due to induced fractures, injection, or water flooding



HAL17804

FUSE-IT™ lost circulation material can be squeezed into loss zones to seal fractures.

FUSE-IT Lost Circulation Material Cured Severe Losses on a Gulf of Mexico Shelf Well

West Cameron Area, Gulf of Mexico Shelf

Operator's Challenge

While drilling with a water-based mud at 5,950 ft with a 12 ¼" bit, the operator experienced massive fluid losses.

The operator unsuccessfully attempted to stop the losses with various competitor pills containing fibers and asphalt materials or cross-linked polymers. The cross-linked polymer did have some success, but broke down after drilling an additional 300 ft.

Halliburton's Solution

Halliburton recommended a FUSE-IT lost circulation pill with spacers. While mixing the pill, the drill pipe was run into open hole to 5,382 ft (14 ft above the losses). The lead spacer then was pumped, followed by the FUSE-IT lost circulation pill, then the tail spacer, and finally 45 bbl of active drilling fluid treated with soda ash to minimize the calcium concentration. When the lead spacer was 10 bbl from the end of the drill pipe, the bag was closed and the pill was bullheaded into the formation at 7 bbl/min.

There was no pressure indication until the pill, plus 50 bbl of mud, had cleared the drill pipe. At that point there was an immediate indication of 150 psi. After an additional 30 bbl were pumped, the pressure increased to 180 psi (casing/drill pipe). After all pumping operations were completed; the pressure was 200 psi and holding. The pressure then was released and drill pipe was pulled to the shoe at 3,500 ft.

Once the drill pipe reached the shoe and the bag was closed, 125 psi was applied with the rig pumps. Initially, the pressure bled down to 50 psi. Continuous pressure of 50 to 100 psi was held for approximately one hour. At this point the drill pipe was pulled out of the hole and a drilling assembly picked up. While pulling out of the hole, mud losses did not occur.

The drilling assembly was tripped into the hole with full returns. At 5,152 ft, the drill pipe was washed and reamed to bottom with a pump rate 270 gal/min and rotary RPM of 120. At 5,400 ft, the FUSE-IT lost circulation pill was tagged. A 2 ft section of pill was reamed through with 4,000 lb with full returns throughout this operation. Washing and reaming continued to 5,550 ft and then the drilling assembly was tripped all the way to bottom, 5,950 ft with full returns.

At 5,950 ft, drilling commenced at 45 ft/hr with a flow rate of 713 gal/min and 2,850 psi standpipe pressure. As drilling progressed, the flow rate was increased to 789 gal/min with an increase in pump pressure to 3,860 psi. Drilling continued at rates of 22 ft to 150 ft/hr.

Economic Value Created

The successful application of the FUSE-IT lost circulation material eliminated time spent trying remedies, which allowed the operator to safely continue drilling operations, resulting in an estimated minimum savings of \$500,000 in non-productive time (NPT) and materials.

Solution Technology from the Solution PeopleSM
For more information contact your Fluid Systems Product Champion.

www.halliburton.com

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