Form-A-Jel plugging agent

A shear-activated lost circulation pill for use when circulation loss is moderate to severe

Plugging agent losses

Form-A-Jel* plugging agent serves to cure losses where cement plugs and conventional particulate lost circulation material (LCM) aren't viable options due to bottomhole assembly (BHA) size limitations, performance, or time constraints. The agent can reduce rig time by being pumped through most conventional BHAs to eliminate tripping. The crosslinking begins immediately after nozzle shear to minimize wait time that would be required for cement plugs. The rapid set time ensures the pill solidifies inside the formation, but near the wellbore.

Advantages with the right plugging agent

- Conforms to any size void.
- Cures losses in large fractures or vugular formations effectively.
- Pumps through conventional BHA.
- Reduces rig time compared with cement plugs.
- Sets the plug fully within 30 min.

Process for successful plugging

The agent is shipped in kits with all the necessary products to mix 40 bbl [6.36 m^3], except for the nonaqueous base fluid and water. A mixing pit with a low-shear paddle mixer or cement batch mixer is required on location to prepare Form-A-Jel agent.

The pill contains oil and water with a proprietary emulsifier, lime, and a blend of viscosifiers that crosslink after shear activation. The pill can be formulated with either diesel or mineral oil depending on availability, local regulations, and exposure to aquifers.

Form-A-Jel agent has a stringent mixing order and rate of addition that must be observed. Mixing, pumping procedures, and placement guidelines for Form-A-Jel agent must be obtained from the online support and knowledge management system during the planning stages. Tanks and lines must be clean and free of any trace of water prior to mixing. It's highly recommended that 5-bbl [0.8-m^3] spacer fluid be pumped before and after the Form-A-Jel agent pill. The spacer should consist of a viscous DUO-VIS* biopolymer viscosifier slurry at 2 lb/bbl [5.7 kg/m^3] mixed into freshwater with a funnel viscosity greater than 45 s.

Prejob testing to confirm shear activation must be completed prior to pumping Form-A-Jel agent to ensure downhole activation once the pill has exited the bit. This consists of a low-shear stability test and high-shear activation test.

Things to be aware of when plugging a well

- Requires a minimum equivalent shear rate of 80,000 s^{-1} across the bit for shear activation. Modeling should be performed during the planning phases in conjunction with the operator and technical service in Houston to ensure the flow rates and nozzle selection are sufficient for activation. Proper nozzles should be in the bit prior to drilling expected loss zones to avoid an additional trip.
- Needs specialized knowledge of the agent to ensure mixing and pumping are done successfully. Prejob training must be completed with the M-I SWACO representative(s) that will be on location for the Form-A-Jel agent operations.
- Crosslinks when excess water is added to Form-A-Jel agent because mixing procedures were not followed.
- Is limited to application in temperatures no greater than 250 degF [121 degC].

Toxicity and handling

Bioassay information is available upon request. Form-A-Jel agent should be treated as an oil-based drilling fluid for waste management and spillage or contaminant purposes. Local waste management requirements for disposing of drilling fluids based on diesel or mineral oil or both and contaminated solids should be followed. Handle as an industrial chemical, wearing protective equipment and observing the precautions as described in the Safety Data Sheet.

Packaging and storage

Form-A-Jel agent is shipped in 40-bbl [6.36-m^3] kits. Each kit is palletized in accordance with packaging guidelines. Store in a dry location away from sources of heat or ignition.