

FORM-A-PLUG II

FORM-A-PLUG* II pumpable lost circulation plug is a blend of borate mineral and polymers designed for suspension, fluid-loss control and crosslinking technology. When activated with time and temperature, FORM-A-PLUG II plug develops a rigid crosslinked gel structure that effectively prevents loss of fluid to the formation. The FORM-A-PLUG II material is acid soluble, more than 95% being dissolved on contact with a solution of 15% HCl.

Typical Physical Properties

Physical appearance.....	White to beige powder
Specific gravity	2.0
pH (1% solution).....	7 - 8
Solubility in water	Slightly

Applications

FORM-A-PLUG II fluid-loss-control plug is the main additive used to form an acid-soluble, lost-circulation plug, which can be used in any application where a squeeze plug would be beneficial. It is particularly advantageous in areas where loss of whole mud is prevalent. FORM-A-PLUG II product can be used to stop losses occurring with any water-base and non-aqueous-base fluid system. FORM-A-PLUG II plug is used for suspension, fluid-loss control and crosslinking in the lost-circulation plug.

FORM-A-PLUG II material can be used in combination with FORM-A-PLUG ACC accelerator and FORM-A-PLUG RET retarder. Together they will make a chemical reaction to form a rigid crosslinked gel structure. It is therefore important to carefully control the product concentrations and mixing conditions in order to ensure that the reaction proceeds as expected.

The formulation can be adjusted for density by adding barite or other appropriate weighting materials up to 18 lb/bbl (2.16 sg). Pilot testing is recommended before use to estimate the time to create a well-set plug. Recommended FORM-A-PLUG II material concentrations are 60 to 100 lb/bbl (170 to 285 kg/m³) depending on the final slurry density.

The plug should be pumped to the annulus at the depth of loss. The drillstring is then pulled above the FORM-A-PLUG II plug. The plug can be squeezed into the loss zone. Be careful not to leave the plug in the pipe even if the losses have stopped or slowed. Do not shut down pumping while the plug is in the drillstring.

Advantages

- Provides suspension, fluid-loss control and crosslinking
- Forms a rigid gel structure

FORM-A-PLUG II RET

- FORM-A-PLUG RET retarder is a grade of soluble magnesium chloride which delays the crosslinking reaction in the FORM-A-PLUG II lost-circulation plug to avoid premature setting during the mixing stage.
- FORM-A-PLUG RET retarder should be added to the drill water before adding FORM-A-PLUG II material and/or FORM-A-PLUG ACC accelerator.
- Pilot testing is recommended before use to estimate the time to create a well-set plug.

FORM-A-PLUG II ACC

- FORM-A-PLUG ACC accelerator is a blend of inorganic compounds designed for pH and salinity adjustment necessary to control the crosslinking reaction in the lost-circulation plug.
- FORM-A-PLUG ACC accelerator should be added to the lost-circulation slurry immediately before pumping the mixture down the well. The accelerator will make a chemical reaction with the FORM-A-PLUG II material to form a rigid crosslinked gel structure.
- Pilot testing is recommended before use to estimate the time to create a well-set plug.

Toxicity and Handling

Bioassay information is available upon request.

Handle as an industrial chemical, wearing protective equipment and observing the precautions as described in the Material Safety Data Sheet (MSDS).

Packaging and Storage

FORM-A-PLUG II material is packaged in 55.1-lb (25-kg) multi-wall, paper sacks. Other package units are available upon request.

Store at moderate temperatures in a dry, well-ventilated area. Keep in original container.

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