

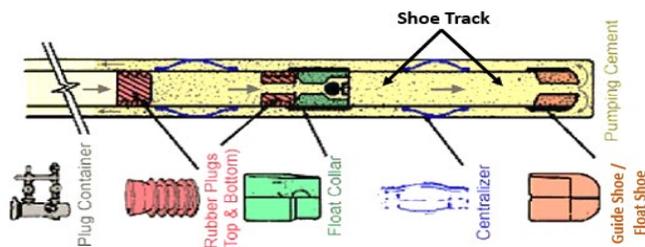
Prohib CMT-Set II

A Wet Shoe and Gelled Retarder Fluid

Introduction

A Shoe Track, as depicted in the picture below, is the space between the float / guide shoe and the landing / float collar. The purpose of a shoe track is to capture the sometimes-contaminated trailing edge of the cement slurry and prevent it from being displaced out the end of the casing, resulting in a wet shoe. A Wet Shoe is defined as the occurrence of unset, contaminated, or no cement in the shoe track after completion of a primary cement job. Usually, a wet shoe is a bad thing, however, with the advent of shale oil and gas drilling and production, well operators may use a wet shoe since it results in cement not remaining in and around the shoe track, thereby, fluid flow remains established through the casing into the well. In this way, the wet shoe enables operators to conduct subsequent operations after cementing, such as pumping down wireline perforating guns and composite plugs to the toe of the well. A wet shoe is used by operators as a cost-saving measure since it eliminates the need and the expense involved in using coiled tubing, stick pipe, or wireline tractors to position perforating guns. If desired, the first stimulation operation can be performed through the wet shoe.

The fluid that is placed in and around the shoe track is called Wet Shoe Fluid, Retarder Water, or Gelled Retarder Water. The purpose of the wet shoe fluid is to flush cement slurry from the shoe track and conceptually, prevent any residual cement from setting inside the shoe track.



Prohib CMT-Set II

Prohib CMT-Set II is a wet shoe and gelled retarder fluid made up of components that synergistically interact to severely lengthen the cement setting process and prevent the cement from building enough compressive strength to affect pumping operations. The mechanisms by which Prohib CMT-Set II works to obstruct the cement hydration process is through (1) the precipitation of a semipermeable layer on the cement grains, (2) nucleate poisoning of Calcium-Silicate-Hydrate and Portlandite, and (3) Calcium ions are chelated, preventing the formation of nuclei. These mechanisms extend the cement hydration process for a time which could be days or weeks, and they may even prevent the cement from setting altogether.

Objectives of Wet Shoe Fluids and Shortcomings of Conventional Options

Conventional wet shoe fluids range from Sugar Water to Acetic Acid based fluids, to Retarder laden fluids, and Gelled Retarder laden fluids. While these fluids provide some delay in the set of the cement, they often don't fulfill their objective of preserving a wet shoe for the eventual pumpdown operations that may occur weeks to even months later. **Wet shoe fluid objectives are to:**

- Be compatible with other fluids in the wellbore.
- Effectively displace the cement and other fluids from the shoe track, creating a medium to long-term flow path for pumpdown operations.
- Effectively delay or prevent the set of cement that may have remained in the shoe track.
- Restrain early and ultimate compressive strength development of cement that may have remained in the shoe track.
- Provide protection to the casing and downhole tools against the low pH nature of Retarder laden wet shoe fluids.

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Benefits of Prohib CMT-Set II

Prohib CMT-Set II was designed to overcome, or at least reduce the shortcomings experienced with conventional wet shoe fluids. It has the following benefits:

- Adequate viscosity to effectively displace fluids ahead of it. Viscosity profile is also adjustable by changing the products thickener component, allowing for viscosity optimization depending on well parameters.
- Blend synergy. Each component of the Prohib CMT-Set blend acts to severely restrict the setting mechanisms of cement.
- Very low corrosive properties, allowing for use on mild steel and aluminum, without concern of damage to such surfaces.

Application

Prohib CMT-Set II can be used with any wet shoe or Toe Sleeve application. It can also be pumped behind Top Plugs on conventional non-wet shoe cement jobs.

Typical Dosage

Prohib CMT-Set II is supplied ready-for-use or as a concentrate. Use the ready-for-use form as supplied, and the concentrate at a concentration of 3 gals/bbl.

Compatibility

Prohib CMT-Set II is compatible with most cement slurry systems and conventional displacement fluids. Test for compatibility prior to use.

Typical Properties

<i>Property</i>	<i>Ready-For-Use Form</i>	<i>Concentrate Form</i>
<i>Form</i>	Liquid	Liquid
<i>Appearance</i>	Clear to Light Yellow	Light Yellow
<i>pH</i>	2.09	0.74
<i>Specific Gravity*</i>	1.018	1.248
<i>Storage Temperature**</i>	30 – 95 °F	14 – 95 °F
<i>Pour Point***</i>	-3 °C (26 °F)	<-17 °C (1.4 °F)

*Specific Gravity values listed are for the base fluids, without the viscosifier.

**Shelf Life is maximized inside a building at stable temperature.

***Pour Point conducted in accordance with ASTM D-97.

Handling and Storage

Use appropriate safety equipment. Avoid inhalation or contact with eyes, skin, or clothing. Wash contaminated clothing before reuse. Store in tightly closed containers in area that is cool, dry, well-ventilated, and out of direct sunlight. Shelf life is estimated to be 1 year; however, testing is ongoing to determine actual shelf life.

Packaging

Prohib CMT-Set II is supplied ready-for-use or as a concentrate. The concentrate is offered in a 5-gal Pail while the ready-for-use form is offered in either a 55-gal drum, or a 275-gal Tote.

Health and Safety

Please refer to Safety Data Sheet (SDS) for complete health and safety information.

All statements, information, and data given herein are believed to be accurate, but are presented without warranty, expressed, or implied. Statements concerning possible use are made without representation or warranty that any such use is free of patent infringement and is not a recommendation to infringe on any patent. The user should not assume that all safety measures are indicated or that other measures may not be required. Any determination of the suitability of a particular product for any use contemplated by the user is the sole responsibility of the user.