



PRODUCT OVERVIEW

PERFORMANCE DATA

GEOTF

GEOTF is a proprietary drilling mud lubricant system designed to reduce torque, drag, and friction in water-based drilling fluids. It also helps decrease wear on the drill bit, and lowers the potential for stuck pipe and bit balling.

GEOTF is a concentrated product specially formulated for use in drilling muds, while also providing excellent corrosion inhibition.

GEOTF helps keep the drill string away from the wellbore during high angle and horizontal drilling by providing a lubricating film to reduce surface-to-surface contact. Laboratory studies show that **GEOTF** effectively reduces torque and friction in a variety of fresh and salt water drilling muds.

GEOTF can be used in water-based drilling muds when drilling in straight or directional wells. Typical use levels are 1-3% by volume.

Lubricity testing was carried out in the following manner – 300 mL of brine was placed into a cell to which 3% v/v of the lubricant was added. The dosed brine was then mixed on an overhead mixer at 1000 rpm for 10 minutes prior to testing to ensure dispersion of the lubricant. Data was collected at room temperature using an Ofite EP/Lubricity meter running at 60 rpm with 150 in-lbs of torque applied over a period of 5 minutes. The cells containing the dosed brines were then sealed and placed in a roller oven to age at different temperatures for 16 hours. At the end of hot rolling, each cell was cooled to room temperature and opened. Each aged brine was thoroughly mixed on an overhead mixer at 1000 rpm for 5 minutes prior to testing at room temperature on the Ofite EP/Lubricity meter running at 60 rpm with 150 in-lbs of torque applied over a period of 5 minutes.

Correction Factor = $34 / x$ water

Coefficient of Friction (COF) = x sample / $100 \times$ Correction Factor

Percent Torque Reduction = x Base Fluid - x sample / x Base Fluid \times 100

The results of lubricity testing are reported as both Percent Torque Reduction and Coefficient of Friction and are calculated from the torque reading generated by the lubricity meter as well as the correction factor on the equipment for that particular day. where is the average of torque readings taken at 3, 4, and 5 minutes.

GEO Drilling Fluids, Inc.

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For more info visit:

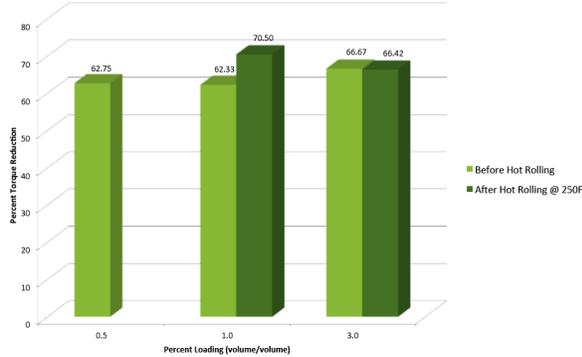
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Drilling Fluids, Inc.

Percent Torque Reduction Given by Torq Free HD in 2% KCl @ 250F HR

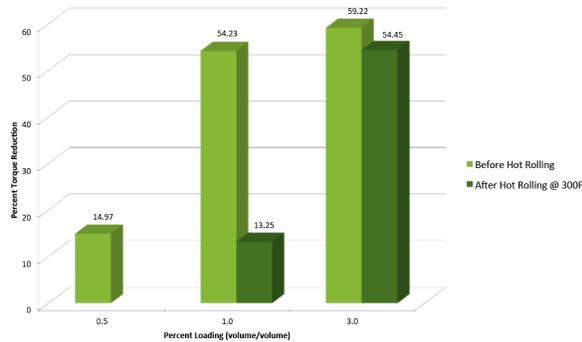


PHYSICAL PROPERTIES

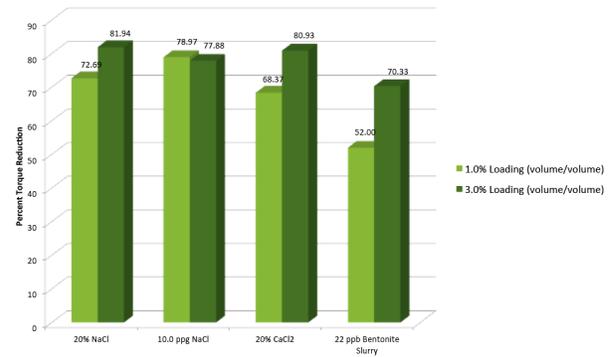
SPECIFIC GRAVITY @ 60 °F	0.89
FLASH POINT, (PMCC) °F	>78
POUR POINT, °F	< -40
VISCOSITY, CPS @ 75 °F	15 - 35
PH (OIL SOLUBLE; MISC. SOLVENTS)	7 - 9

* For most current data, please refer to SD Sheet.

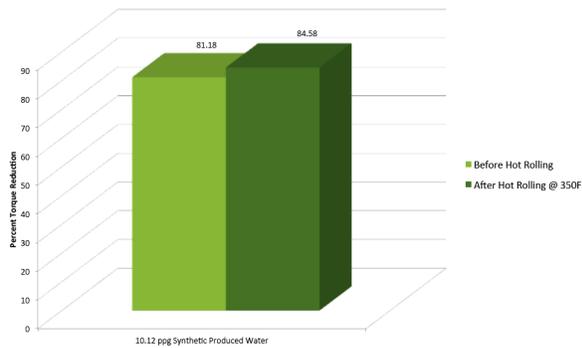
Percent Torque Reduction Given by Torq Free HD in 11.0 ppg CaCl₂ @ 300F HR



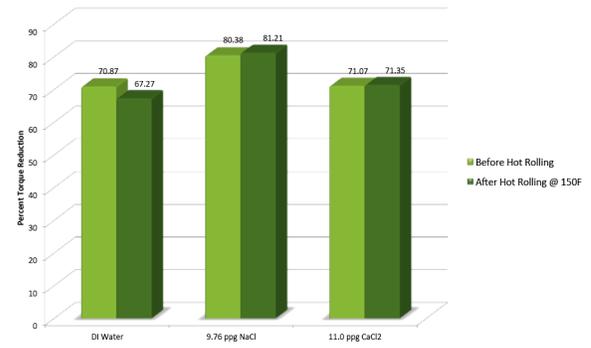
Percent Torque Reduction Given by Torq Free HD in Various Matrices @ 150°F HR for 16 Hours



Percent Torque Reduction Given by 3% (volume/volume) Torq Free HD in 10.12 ppg Synthetic Produced Water @ 350F HR



Percent Torque Reduction Given by 3% (volume/volume) Torq Free HD in Various Matrices @ 150F HR



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