



DOVERLUBE DFA-1121

Oil Based Mud ROP Enhancer

Oil Based Muds (OBM) and Synthetic Oil Based Muds are being used extensively for Land-Based and Off-Shore drilling. The Rate of Penetration (ROP) can be improved through the addition of an ROP enhancer in both an Invert and a Synthetic system.

Dover Chemical has developed a unique chemistry that has proven to improve the ROP:

Evaluation Method

Significant lubricity improvement was demonstrated using a modified Baroid/Ofite Lubricity meter. The usual steel block of the Baroid/Ofite lubricity meter was replaced with a shale rock block. One (1.0%) percent of the ROP Enhancer and 20% Rev Dust were added to a fresh Invert-OBM from North Dakota's Bakken-Williston Basin. Torque was measured at various RPM, while holding pounds constant.

Mud Formula:

- Invert OBM
- 1.0 % ROP Enhancer, **Doverlube DFA 1121**
- 20 % Rev Dust
- AHR: Hot Rolled Aging: 16 hours at 250 °F

Rheology

Parameters AHR	Blank	1% Doverlube DFA 1121	1% Field Lubricant
600 rpm	115	106	115
300 rpm	62	57	62
PV	53	49	53
YP	9	8	9
10s gel	6	5	6
10 min	12	11	12

Comments:

Doverlube DFA 1121 did not significantly affect rheology.

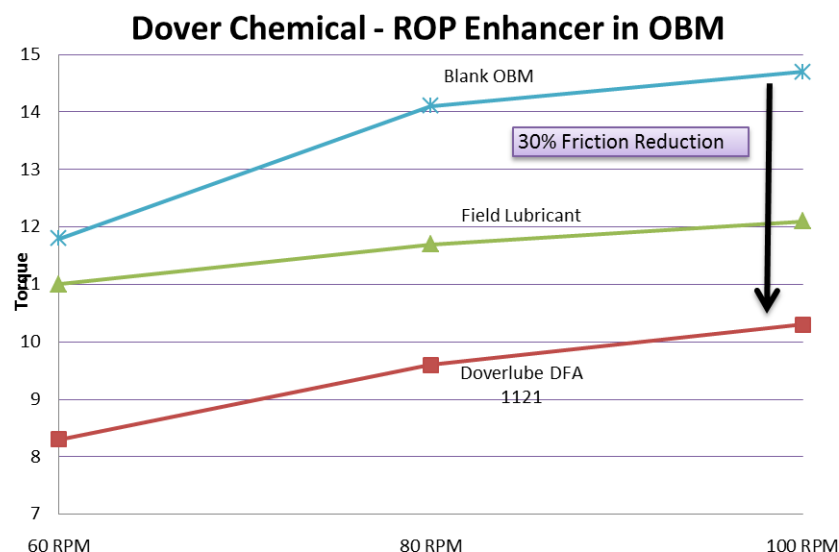
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Lubricity (AHR):

Modified Baroid/Ofite Lubricity Test:

ROP Enhancer – Torque	60 RPM	80 RPM	100 RPM
Doverlube DFA 1121	8.3	9.6	10.3
Field Lubricant	11	11.7	12.1
Blank OBM	11.8	14.1	14.7



Comments:

Doverlube DFA 1121 provides friction reduction of up to 30%, and will result in significant ROP enhancement. In addition **Doverlube DFA 1121** is a low toxicity and biodegradable product which can be used both for Offshore and Land Based operations.

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