

Author's Accepted Manuscript

Curve-fitting equation for prediction of the start-up stress overshoot of an oil-based drilling fluid

Diogo E.V. Andrade, Rubens R. Fernandes, Tainan G.M. dos Santos, Emanuel Vitor Ceccon, Ana C.B. da Cruz, Admilson T. Franco, Cezar O.R. Negrão



www.elsevier.com/locate/petrol

PII: S0920-4105(16)30301-1
DOI: <http://dx.doi.org/10.1016/j.petrol.2016.07.037>
Reference: PETROL3570

To appear in: *Journal of Petroleum Science and Engineering*

Received date: 9 May 2016
Revised date: 6 July 2016
Accepted date: 26 July 2016

Cite this article as: Diogo E.V. Andrade, Rubens R. Fernandes, Tainan G.M. dos Santos, Emanuel Vitor Ceccon, Ana C.B. da Cruz, Admilson T. Franco and Cezar O.R. Negrão, Curve-fitting equation for prediction of the start-up stress overshoot of an oil-based drilling fluid, *Journal of Petroleum Science and Engineering*, <http://dx.doi.org/10.1016/j.petrol.2016.07.037>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Curve-fitting equation for prediction of the start-up stress overshoot of an oil-based drilling fluid

Diogo E. V. ANDRADE, Rubens R. FERNANDES, Tainan G. M. dos SANTOS, Emanuel Vitor CECCON, Ana C. B. da CRUZ, Admilson T. FRANCO, Cezar O. R. NEGRÃO*

Federal University of Technology-Paraná – UTFPR, Postgraduate Program in Mechanical and Materials Engineering – PPGEM, Research Center for Rheology and Non-Newtonian Fluids – CERNN, 80230-901, Av. Sete de Setembro 3165, Curitiba, PR, Brazil

*Corresponding Author, Phone: +55 41 3310-4658, Fax +55 41 3310-4772.
negrao@utfpr.edu.br

Equation Chapter 1 Section 1

Abstract

Drilling fluids usually gel at rest in order to avoid cuttings to precipitate over the drill bit when circulation is interrupted. At flow start-ups, pumping pressures higher than the steady-state circulation pressure are usually required to surpass the gel strength. The gel-liquid transition may have significant importance, especially in ultra-deep waters where high pressures and low temperatures take place. In the current work, controlled shear rate rheometric tests were conducted to investigate the yielding of an oil based drilling fluid. An algebraic equation, that accounts for both shear rate and shear history, is proposed to predict the gel breaking. This equation requires less fitting parameters than the current structural kinetic models available in literature, and is quite useful to represent the pressure peaks that take place during drilling fluid flow start-ups. The equation fit to rheometric data and is able to predict satisfactorily the start-up shear stress of a gelled drilling fluid at different shear rates.

Key words: drilling fluids; constant critical strain; start-up tests; fitting equation

Nomenclature

AAD%: Average Absolute Deviation [%]

C_1 : Constant dependent of the boundary conditions [-]

C_2 : Constant dependent of the boundary conditions [-]

γ : Strain [-]

$\dot{\gamma}$: Shear rate [s^{-1}]

Download English Version:

<https://daneshyari.com/en/article/8126008>

Download Persian Version:

<https://daneshyari.com/article/8126008>

[Daneshyari.com](https://daneshyari.com)