
Pipa Spiral sebagai Alat Transportasi Slurry

Staff : Yanuar, Ridwan, Budiarso and Raldi Artono Koestoer
Students : -
Sponsors : RUUI
Email contact : yanuar@eng.ui.ac.id, mftbd@eng.ui.ac.id,
budiarso_ui@yahoo.com, koestoer@eng.ui.ac.id

When the slurry's speed of flow is not sufficiently high the particles will not be maintained in suspension. On the other hand, in the case of highly viscous mixtures, if the shear rate in the pipeline is excessively low the mixture will be too viscous and will resist flow. In spiral pipe twisted with a constant pitch in relation to the axis a swirling flow occurs when fluids flow in the pipe. Mud slurry flows are mixed by the swirling flow.

The aim of this study is to examine the hydraulic transport of mud slurry flowing in the spiral pipe with three-shape groove pipe walls by measuring the pressure drop. The shear stress and the shear strain are calculated by measuring the pressure drop and outlet in circular pipe. The power law exponent were about 0.93 – 1.0 for mud slurry solution of 45%, 30% and 20% weight concentrations, respectively. The results indicated that the apparent viscosity of mud slurry solution is not proportional to the shear stress and shear strain but the relationship is approximated by model of power law (pseudo plastic fluid). The friction factor of mud slurries in a spiral pipe with ratio pitch per diameter 6.7 lower than circular pipe and spiral pipe with $P/D_i = 3.9$ and 6.7. It was shown that the spiral pipe caused drag reduction in flowing of mud slurries.

Keywords: hydraulic transport, pressure drop, spiral pipe, mud slurry, friction factor, drag reduction, power law index.