

Aging Cells

Description

Drilling fluid aging is the process in which a drilling fluid sample, previously subjected to a period of shear, is allowed to more fully develop its rheological and filtration properties. The time period needed to more fully develop properties varies from as little as several hours (usually 16 hours) to as much as several days. The aging can be done at either ambient or elevated temperatures.



Aging Cells, Glass Liner & Accessories

Drilling Fluids and Components

Most drilling fluid formulations contain a base liquid and additives which must be dissolved or mechanically dispersed into the liquid to form a homogenous fluid. The resulting fluid may contain one or more of the following: water-dispersible (soluble) polymers or resins, clays or other insoluble but dispersible fine solids, and soluble salts. The fluids are mixed or sheared for times appropriate to achieve a homogenous mixture and are then set aside to "age." Aging is done under conditions which vary from static to dynamic and from ambient to highly elevated temperatures.

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"The Original Testing Equipment Company"

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The recommended equipment and procedures for aging water-based drilling fluids may be found in ***API Recommended Practice 13B-1*** and ***API Recommended Practice 13I***.

Mixing/Blending/Shearing Devices

Drilling fluid formulations are commonly mixed with various shearing devices which may be either fixed speed or variable speed. The motors may turn mixing shafts with rounded "propellers," sharp blades, wave-form shapes, or others. Single shaft or multiple shaft devices are used. Some examples of the more widely used mixer types are: Hamilton Beach® Model 936 mixer, Dispersator® high shear mixer, Waring® Blendor™ mixer, Multi-Mixer® Model 9B mixer with 9B29X impeller, Silverson® Model 14LR mixer, and Oliani® mixer. Nozzle shear devices are also used to prepare some formulations.

Shearing devices vary widely in the amount of shear they impart. Longer shearing times may be required for low shear devices to achieve complete dissolution/hydration of fluid components; while high shear devices may produce nearly completely yielded drilling fluid blends in a few minutes. Aging of drilling fluid samples tends to minimize differences in properties which can result from shearing treatment.

pH Levels of Drilling Fluids or Base Fluids

The pH of a drilling fluid formulation containing bentonite clays usually never falls below a value of 8.5 unless acidic material are added to these based fluids. Except for some drilling fluid systems viscosified with certain water-soluble polymers, the pH of these formulations is usually raised above pH 8.5 with alkalinity control agents, such as sodium or potassium hydroxide (caustic soda or caustic potash), or calcium hydroxide (lime).

Fluid alkalinity is lowered by the reaction of hydroxide groups with aluminosilicates (clays), gradually at ambient temperature and rapidly at elevated temperature. Some drilling fluid additives require that alkalinities be maintained within certain narrow, but elevated, ranges in order to function at optimum levels. Therefore, pH levels are often raised after aging if there has been a substantial pH drop.

Aging Cell Specifications

Fann Part No.	Material	Volume ml	Maximum Working Pressure		Maximum Temperature	
			psig	kPa	°F	°C
210285	303 Stainless Steel	500	2500	17237	500	260
210286	316 Stainless Steel	500	2500	17237	500	260
210288 ²	303 Stainless Steel	260	2500	17237	350 ¹	177
210289	303 Stainless Steel	260	2500	17237	350 ¹	177
210290 ²	303 Stainless Steel	500	2500	17237	500	260
210291	316 Stainless Steel	260	2500	17237	350 ¹	177
210292 ²	316 Stainless Steel	260	2500	17237	350 ¹	177
210294 ³	303 Stainless Steel	500	2500	17237	500	260
210316 ²	316 Stainless Steel	500	2500	17237	500	260

¹Cells are rated at 350°F (177°C) since allowable sample size becomes less than 200 ml at higher temperatures.

²Cells cannot be pressurized.

³Corrosion coupon holder and gas injection tube are mounted to inner cap.

Fann Instrument Company offers a complete line of equipment, materials and supplies for use in testing drilling fluids in accordance with The American Petroleum Institute:

API Recommended Practice 131, ANSI/API 131/ISO 10416