

Aging Cells

Description

Drilling fluid aging is the process of setting aside a mixed or sheared fluid to let its rheological and filtration properties fully develop. A homogenous fluid is aged under conditions, such as static, dynamic, ambient, or high temperature.

Fann's High Temperature Aging Cells are designed for use in aging tests which help predict the performance of a drilling fluid under static, high temperature conditions.

Application

Aging time varies from 16 hours to several days at ambient or high temperatures.

Drilling Fluids and Components

Most formulations contain a base liquid and additives, which must be dissolved or mechanically dispersed. Additives include water-dispersible (soluble) polymers or resins, clays, insoluble but dispersible fine solids, and soluble salts.

Shearing Devices

Shearing devices (mixers or blenders) may be fixed or variable speed. Mixing shafts include rounded propellers, sharp blades, and wave-form shapes. Single shaft or multiple shafts are also options. Widely-used mixers include Hamilton Beach® Model 936 Mixer, Fann® High Shear Mixer, Waring® Blender, Multi-Mixer Model 9B, and Silverson® Model 14LR Mixer.

Shearing devices differ in the amount of shear they impart. Low shear devices may require longer shearing times for completely dissolving or hydrating components; while high shear devices



produce completely yielded drilling fluids in a few minutes. Aging tends to minimize differences in properties caused by shearing.

pH of Drilling Fluids

The pH of a drilling fluid formulation containing bentonite clay is usually greater than 8.5 unless acidic material is added. The pH is usually raised by adding sodium hydroxide (caustic soda), potassium hydroxide (caustic potash), or calcium hydroxide (lime), except in fluids containing water-soluble polymers.

Fluid alkalinity decreases by reaction of hydroxide groups with aluminosilicates (clays), gradually at ambient temperature and rapidly at elevated temperature. Some drilling fluid additives require narrow, but elevated alkalinity ranges for optimum performance. Therefore, pH is often raised after aging if the pH drops substantially.

Aging Cell Part Numbers and Specifications

Part No.	Material	Volume	Maximum Working Pressure		Maximum Temperature	
			ml	psig	kPa	°F
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	3501	177
210289	303 Stainless Steel	260	2500	17237	3501	177
210290 ²	303 Stainless Steel	500	2500	17237	500	260
210291	316 Stainless Steel	260	2500	17237	3501	177
210292 ²	316 Stainless Steel	260	2500	17237	3501	177
210294 ³	303 Stainless Steel	500	2500	17237	500	260
210316 ²	316 Stainless Steel	500	2500	17237	500	260

1 Cells are rated at 350°F (177°C) since the allowable sample size becomes < 20 ml at higher temperatures.
2 Cells cannot be pressurized.
3 Corrosion coupon holder and gas injection tube are mounted to inner cap.

Aging Cell Accessories

- Part No. 210297 — Teflon® Lid for Glass Liner
- Part No. 210295 — Glass Liner, 260 ml Aging Cell
- Part No. 210296 — Glass Liner, 500 ml Aging Cell

Fann Instrument Company offers a complete line of equipment, materials, and supplies for analyzing various drilling fluids and oil well cements in accordance with API Specifications and API Recommended Practices.