

## Differential Sticking

*Most incidences of stuck pipe are caused by differential-pressure effects. Excessive differential pressures across lower-pressure permeable zones can cause the drillstring to push into the wellbore wall where it becomes stuck. When differential sticking occurs, spotting fluid can sometimes free the drillpipe.*

*Differential sticking may be identified by the following characteristics:*

- ◆ *Pipe sticks after remaining motionless for a period of time*
- ◆ *Pipe cannot be rotated or moved when circulation is maintained*



The Differential Sticking Tester was designed to determine how likely a given drilling fluid will be to produce a "stuck pipe" situation and how effective a given drilling fluid treatment or application of spotting fluid in any given drilling fluid would be in reducing this tendency. This measurement is called the "Stuck Tendency Coefficient". It takes into account both the stickiness and the cake building capability of the drilling fluid. The "Stuck Tendency Coefficient" is determined by the Timed Filtrate Test.

The use of the optional yoke attachment along with the radius'd torque plate allows a measurement called "Bulk Sticking Coefficient" to be obtained. By measuring the area of caking using a controlled cake thickness during the test, the "Bulk Sticking Coefficient" is obtained. The Bulk Sticking Coefficient is determined by the Fixed Cake Thickness Test.

The unit can be pressurized by the CO<sub>2</sub> regulator assembly or from any nitrogen source. If Nitrogen is to be used, the Differential Sticking Tester must be fitted with a suitable Nitrogen regulator, gauges, relief valve, hose and fittings. The standard test uses 477.5 psig (3292 kph) differential pressure applied to a stainless steel vessel of approximately 140 ml capacity. The measurement can be made using either the flat-faced torque plate or the 12-1/2" (31.75 cm) spherical radius plate which approximates pipe in casing or collars in borehole contact geometry. (Both are provided.) In the event of a "sticky" sample that tends to adhere more to the torque plate than to the filter paper, stainless steel micro-corrugation disks are provided, to help ensure success of the test.

## Parts and Accessories

PART NO.	DESCRIPTION
209471	CO <sub>2</sub> PRESSURIZED ASSEMBLY
205091	RETAINER WRENCH
21158	LEVER
21161	CELL BODY
21162	CELL CAP
21163	CELL SCREEN HOLDER
21164	FILTER RETAINER RING
206913	FLAT BOTTOMED TORQUE PLATE
206908	RUBBER RING GASKET
206909	PLASTIC RING GASKET
207232	SUPPORT SCREEN
206910	LOCKING MESH DISC
21155	* POSITION YOKE ASSEMBLY
206914	SPHERICAL TORQUE PLATE
209496	VALVE STEM
205649	"O" RING 3/16 X 5-1/16 X 1/16
205662	"O" RING 2-1/4 X 2-1/2 X 1/8
205652	"O" RING 1/2 X 3/8 X 1/16
205665	"O" RING 3-3/4 X 3-1/2 X 1/8
205640	SPANNER WRENCH
205639	TORQUE WRENCH
208608	BOX OF CO <sub>2</sub> CARTRIDGES
209516	LOCK PIN
205868	GRADUATED CYLINDER, 25 ml TC
205636	SOCKET, 5/16



**Position Yoke (Optional Accessory)**

A modification of the timed filtration sticking test may be used to obtain a predetermined cake thickness test. In this test the bulk sticking coefficient is determined. This test requires an optional "Position Yoke". By using the Position Yoke, the sticking coefficient of a controlled cake thickness can be measured. The yoke attaches onto the cell cap and is used to set the torque plate at a given distance from the filter surface.

### Specifications

Capacity:	140 ml cell
Dimensions:	13.5" x 7.5" x 6.25"
Weight:	23 pounds
Pressure:	477 psig

## Order No. 206906 Differential Sticking Tester

**Fann Instrument Company offers a complete line of instruments for use in testing drilling fluids in accordance with the following American Petroleum Institute publications:**

API Recommended Practice 13B-1, ANSI/API 13B-1/ISO 10414-1,  
API Recommended Practice 13B-2, & API Specification 13A