
Test Procedure for**SLURRY TESTING****TxDOT Designation: Tex-130-E****Effective Date: January 2009**

**1. SCOPE**

- 1.1 Part I of this test method covers sampling bentonite slurry.
- 1.2 Part II determines the density of slurries used in slurry construction techniques, such as those used for barriers to control the horizontal movement of liquids. This test method is modified from the American Petroleum Institute (API) Recommended Practice 13B, Standard Procedure for Field Testing Drilling Fluids.
- 1.3 Part III determines the sand content of slurries used in slurry construction techniques.
- 1.4 Part IV is used as an indication of viscosity of drilling fluids.
- 1.5 The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

PART I—SAMPLING BENTONITE SLURRY

2. SCOPE

- 2.1 This part details the steps for sampling bentonite slurry.

3. APPARATUS

- 3.1 *Slurry Sampler*, or equal, approximately 3 in. (76 mm) inside diameter and 12–14 in. (305–356 mm) long.

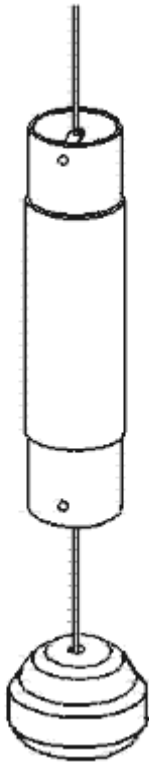


Figure 1—Slurry Sampler

4. PROCEDURE

- 4.1 Hold the right circular cylinder with one hand.
- 4.2 With the other hand, let the bottom of the sampler slowly descend until it reaches the bottom of the hole containing bentonite slurry.
- 4.3 While holding the rope above the cylinder, let the right circular cylinder drop into the slurry.
- 4.4 After the right circular cylinder reaches the bottom, pull up the sampler slowly.
- 4.5 Place the contents of the sampler in a container of approximately 1–2 gal. (3.8–7.6 L).

PART II—MEASURING THE DENSITY OF DRILLING SLURRIES

5. SCOPE

- 5.1 This part determines the density of slurries used in slurry construction techniques, such as those used for barriers to control the horizontal movement of liquids.

6. APPARATUS

- 6.1 *Mud Balance*, or any instrument of sufficient accuracy to permit measurement within ± 0.01 g/cc; however, the mud balance is the instrument generally used.
- 6.1.1 The mud balance consists of a mud cup attached to one end of a beam, which is balanced on the other end by a fixed counterweight and a rider free to move along a graduated scale.
- 6.1.2 A level bubble is mounted on the beam.
- 6.1.3 Attachments for extending the range of the balance may be used.

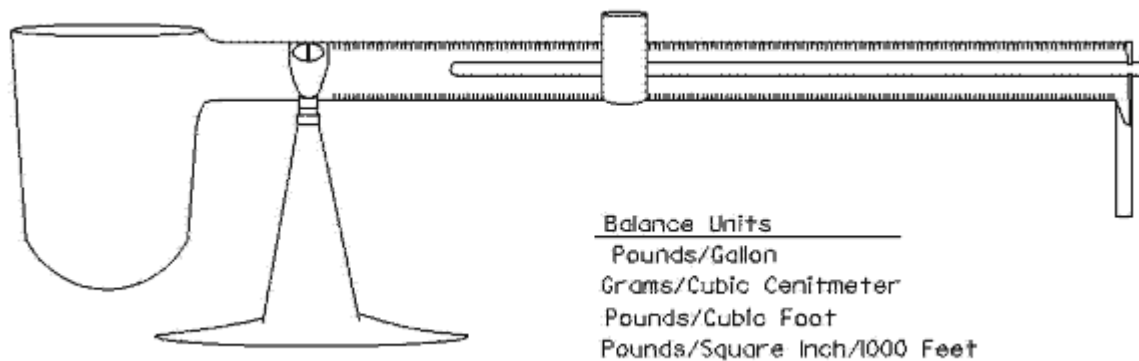


Figure 2—Mud Balance

7. CALIBRATION

- 7.1 The mud balance should be calibrated annually. Calibration can be checked by:
- filling the cup with water;
 - placing the lid in the cup, allowing excess water to overflow; and
 - placing the rider on the specific gravity mark equal to 1.00, at which time the balance should level.

8. PROCEDURE

- 8.1 Set up the instrument base approximately level.
- 8.2 Fill the clean, dry cup with slurry to be tested. Place the cap on the cup and rotate until firmly seated. Make sure some of the slurry is expelled through the hole in the cap to free trapped air or gas.
- 8.3 Wash or wipe the excess slurry from the outside of the cup.

- 8.4 Place the beam on the support and balance it by moving the rider along the graduated scale. The beam is horizontal when the leveling bubble is on the center line.
- 8.5 Read the density at the side of the rider toward the knife-edge. Make appropriate corrections when a range extender is used.
- 8.6 Clean and dry the instrument thoroughly after each use.
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9. CALCULATIONS

- 9.1 Convert the density to other units using the following relationships:
- Specific gravity = read directly off balance.
- Specific gravity (p) in lb/ft³ (kg/m³) = (specific gravity (p) in g/cc) (1000) (62.4).
- Specific gravity (p) in lb/gal (kg/L) = (specific gravity (p) in g/cc) (70.0) (8.35).
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10. REPORTING

- 10.1 Record the specific gravity to the nearest 0.01.
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PART III—STANDARD TEST METHOD FOR SAND CONTENT BY VOLUME OF DRILLING SLURRIES

11. SCOPE

- 11.1 Part III determines the sand content of slurries used in slurry construction techniques.
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12. APPARATUS

- 12.1 *Sand-Content Set*, consisting of the following:
- sieve, No. 200 (75 μm), 2 in. (50 mm) in diameter
 - funnel, to fit screen and glass measuring tube
 - measuring tube, glass tube should be marked from 0 to 20% volume.
- Note 1**—Volume of sand, including void spaces, is measured and expressed as percent by volume of slurry.
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Figure 3—Sand Content Set

13. PROCEDURE

- 13.1 Fill the glass measuring tube to the designated mark with slurry.
- 13.2 Add water to the next designated mark.
- 13.3 Close the mouth of the tube and shake vigorously.
- 13.4 Pour the mixture into the clean, wet No. 200 (75 μm) sieve.
- 13.5 Discard the liquid that passes through the sieve.
- 13.6 Add more water to the tube, shake, and pour into the sieve. Repeat until the water, which passes through the sieve, is clear.
- 13.7 Wash the sand retained on the sieve to clean any remaining slurry.
- 13.8 Attach the funnel upside down over the top of the sieve.
- 13.9 Carefully invert assembly and insert tip of funnel into the mouth of glass measuring tube.
- 13.10 With a fine spray of water, wash the sand retained on the sieve back into the measuring tube.
- 13.11 Allow the sand to settle.
- 13.12 Read the volume of sand from the graduation on the glass tube as a percent of the volume of slurry originally added in Section 13.1.
- 13.13 Wash and dry all equipment thoroughly after each test.

14. REPORT TEST RESULTS

14.1 Report volume of sand to nearest whole percent.

PART IV—STANDARD TEST METHOD FOR VISCOSITY OF DRILLING SLURRY**15. SCOPE**

15.1 Use this part as an indication of viscosity of drilling fluids.

16. APPARATUS

16.1 *Graduated cup*, 1 L (1 qt.)

16.2 *Stopwatch*.

16.3 *Marsh Funnel*, calibrated to outflow 1 qt. of fresh water at a temperature of $70 \pm 5^\circ\text{F}$ ($21 \pm 3^\circ\text{C}$) in 26 ± 0.5 seconds.

Item	Measurement	Requirement
Funnel Core	Length	12.0 in. (305 mm)
	Diameter	6.0 in. (152 mm)
	Capacity to bottom of screen	1500 cc
Orifice*	Length	2.0 in. (50.8 mm)
	Inside Diameter	3/16 in. (4.7 mm)
	Screen	No. 12 (1.70 mm)

*Orifice fixed at a level 3/4 in. (19.0 mm) below top of funnel.

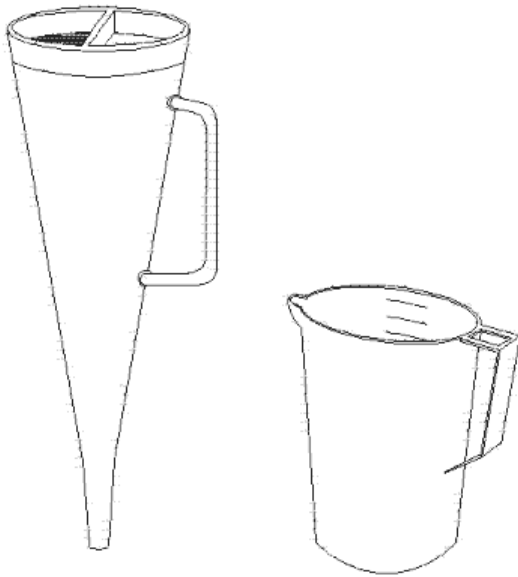


Figure 4—Marsh Funnel and Cup

17. PROCEDURE

- 17.1 Cover the funnel orifice with a finger, and pour freshly sampled drilling fluid through the screen into the clean, upright funnel. **Fill until fluid reaches the bottom of the screen.**
- 17.2 Remove finger and start stopwatch. Measure the time for the **mud to fill to the 1 qt. (946 cm³) mark on the cup.**
- 17.3 Report the time to nearest second as Marsh funnel viscosity.

18. ARCHIVED VERSIONS

- 18.1 Archived versions are available.