Designation: D6910 – 04

Standard Test Method for Marsh Funnel Viscosity of Clay Construction Slurries[1]

This standard is issued under the fixed designation D6910; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method provides an indirect measurement of the viscosity of clay slurries using a funnel (Marsh Funnel) and a graduated cup of specific dimensions. This test method provides a practical indicator of the viscosity on a routine basis. This test method has been modified from the API Recommended Practice 13B-2.

1.2 The result determined using the method is referred to as the Marsh Funnel Viscosity.

1.3 This test can be performed in the laboratory, or used in the field to assess the apparent viscosity of a clay slurry for quality control purposes. The most commonly used slurry is a bentonite clay slurry.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D653 Terminology Relating to Soil, Rock, and Contained Fluids

2.2 *API Document:*

API Recommended Practice, Standard Procedure for Testing Drilling Fluids, Sixth Edition[3]

3. Terminology

3.1 For definitions of common terms in this standard, refer to Terminology D653.

3.1.1 *marsh funnel viscosity (MFV)*—also known as *funnel viscosity*. The time required (in seconds) for 946 mL (1 qt) of a slurry to flow into a graduated cup from a funnel (known as a Marsh Funnel) with specific dimensions. The Marsh Funnel Viscosity is not a true viscosity, it is only an apparent value and good in a relative sense. Low MFV values are obtained for slurries with high viscosity and high MFV values are obtained for slurries with low viscosity.

4. Summary of Test Method

4.1 In this method, a slurry is poured into a funnel with specific dimensions (Marsh Funnel). The slurry is then allowed to flow into a graduated cup. The time for the slurry to fill a volume of 946 mL (1 qt) is measured and reported as the Marsh Funnel Viscosity. The test temperature is also reported for comparison purposes.

5. Significance and Use

5.1 This test method allows for the assessment of an apparent viscosity of clay slurries in the laboratory and in the field. Viscosity is a fundamental characteristic for slurries in construction applications. The Marsh Funnel Viscosity test can be used for field quality control of slurries. Relative changes in slurry viscosity can be identified using Marsh Funnel measurements and modifications can be made to mixing and handling procedures.

5.2 In this test, it is assumed that the apparent viscosity of a slurry is directly related to the flow duration through a specially shaped funnel (the Marsh Funnel).

NOTE 1—The development of the Marsh Funnel is credited to Hallan N. Marsh of Los Angeles who published the design and use of his funnel viscometer in 1931.

5.3 In slurry wall construction and other applications, the viscosity of a slurry must be maintained at a level high enough to assist in stabilizing the trench walls. Slurry viscosity is also directly related to filter cake permeability.

5.4 The Marsh Funnel Viscosity has been widely used in drilling soil and rock for water wells, oil, gas, soil stabilization, and the application of hydraulic barriers.

5.5 Inert suspended solids such as fine sands and additives affect the viscosity of slurries. This test may be used to determine the relative effects of this and other such materials on the viscosity of a slurry.

NOTE 2—The quality of the result produced by this standard is dependent on the competence of the personnel performing it, and the suitability of the equipment and facilities used. Agencies that meet the

[1] This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.04 on Hydrologic Properties and Hydraulic Barriers.

Current edition approved Jan. 1, 2004. Published February 2004. DOI: 10.1520/D6910-04.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from The American Petroleum Institute (API), 1220 L. St., NW, Washington, DC 20005.