

ICS 75.020
CCS E 13



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 16783-1997

Replacing GB/T 16783.1-2014

**Petroleum and natural gas industries - Field testing of drilling
fluids - Part 1: Water-based fluids
(English Translation)**

Issued on: August 29, 2025

Implemented on: December 1, 2025

Issued by: State Administration for Market Regulation

Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative References	
3 Terms and Definitions	
4 Symbols and Abbreviations	
4.1 Symbol	
4.2 Abbreviations	
5 Drilling fluid density 4.	
5.1 Principle	
5.2 Instruments	
5.3 Measurement Procedure	
5.4 Calculation	
6 Supplementary Methods for Drilling Fluid Density Measurement	
6.1 Principle	
6.2 Instruments	
6.3 Measurement Procedure	
6.4 Calculation	
7 Viscosity and Shear Stress	
7.1 Principle	
7.2 Viscosity determination using a Markovnikov funnel	
7.3 Determination of viscosity and shear force using a direct-reading viscometer	
8 Filtration loss 9.	
8.1 Principle	
8.2 Low Temperature and Low Pressure Filtration Loss Test	
8.3 High Temperature and High Pressure (HTHP) Filtration Loss Test	
9 Water, oil, and solids content.	
9.1 Principle	
9.2 Instrument	
9.3 Measurement Step	
9.4 Calculate	
10 Sand content	

- 10.1 Principle
- 10.2 Instruments
- 10.3 Measurement Procedure
- 11 Methylene Blue Capacity
 - 11.1 Principle
 - 11.2 Medicines and Instruments
 - 11.3 Measurement Procedure
 - 11.4 Calculation
- 12 PH value
 - 12.1 Principle
 - 12.2 Medicines and Instruments
 - 12.3 PH value determination procedure
 - 12.4 Electrode Maintenance
- 13 Alkalinity and lime content
 - 13.1 Principle
 - 13.2 Medicines and Instruments
 - 13.3 Determination of phenolphthalein alkalinity and methyl orange alkalinity of filtrate
 - 13.4 Determination of Phenolphthalein Alkalinity in Drilling Fluids - Procedure
 - 13.5 Calculation based on Pf and Mf ion concentrations
 - 13.6 Estimation of Lime Content
- 14 Chloride ion content
 - 14.1 Principle
 - 14.2 Medicines and Instruments
 - 14.3 Measurement Procedure
 - 14.4 Calculate
- 15 Total hardness based on calcium ions.
 - 15.1 Principle
 - 15.2 Medicines and Instruments
 - 15.3 Measurement Procedure
 - 15.4 Calculate
- 16 Lubrication performance
 - 16.1 Principle
 - 16.2 Medicines and Instruments
 - 16.3 Measurement Procedure
 - 16.4 Calculate

Appendix A (Informative) Structure Numbering Comparison Table

Appendix B (Informative) Summary of Technical Differences and Their Reasons Table

Appendix C (Informative) Sampling, Inspection, and Rejection

C.1 Overview

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 1 of GB/T 16783 "Field Testing of Drilling Fluids for the Petroleum and Natural Gas Industry". GB/T 16783 has been published.

The following parts were included.

---Part 1: Water-based Drilling Fluids;

---Part 2: Oil-based drilling fluids.

This document replaces GB/T 16783.1-2014 "Field Testing of Drilling Fluids for Petroleum and Natural Gas Industry - Part 1: Water-based Drilling Fluids".

Compared with GB/T 16783.1-2014, the main technical changes in the "Liquid" standard, apart from structural adjustments and editorial modifications, are as follows.

- a) The scope has been changed (see Chapter 1, Chapter 1 of the 2014 edition);
- b) The terms and definitions of "ACS reagent grade," "Darcy," "quarters," "instantaneous filtration loss," and "sampling tube method" have been removed (see [link]).

Chapter 2 of the 2014 edition);

- c) Some symbols have been deleted, the descriptions of some symbols have been changed, and some symbols and their descriptions have been added (see 4.1, 3.1 in the 2014 edition);

- d) The abbreviations "AA", "ACS", and "ASTM" were removed; the abbreviation "EDTA" was changed; and the abbreviation "STPB" was added (see...).

4.2 (3.2 in the 2014 edition);

- e) The densitometer calibration method and supplementary density determination method have been revised (see 5.2.1, 6.2.1, 6.3; 4.2.1 and 5.2.1 in the 2014 edition).

- f) Increased requirements for the temperature control accuracy of the thermometer (see 5.2.2, 6.2.2, 7.2.1.4, 7.3.1.3, J.2.3);

- g) The procedure for determining viscosity and shear force using a direct-reading viscometer has been modified (see 7.3.2, 6.3.2 of the 2014 edition);
- h) The unit of plastic viscosity has been changed (see 7.3.3, 6.3.3 in the 2014 edition);
- i) The principle and test procedure for filtration loss have been modified (see Chapter 8, Chapter 7 of the 2014 edition);
- j) The instrument "vernier caliper or steel ruler" has been added (see 8.2.1.4, 8.3.1.7);
- k) Added information such as the stirring speed of the high-speed stirrer (see 8.3.1.6, H.3.6, I.3.6);
- l) The principles, instruments, and determination procedures for measuring water, oil, and solid content have been modified (see 9.1, 9.2.2, 9.3.1; 8.1 and 8.2.2 in the 2014 edition). 8.3.1);
- m) The requirements for fine steel wire bristles have been changed (see 9.2.3, 8.2.3 in the 2014 version);
- n) The procedure for determining sand content has been modified (see 10.3.4, 9.3.4 in the 2014 edition);
- o) The reagent purity requirements for methylene blue have been changed (see 11.2.1, 10.2.1 in the 2014 version);
- p) The procedure for determining methylene blue has been modified (see 11.3.1, 10.3.1 in the 2014 edition);
- q) The instrument requirements, measurement procedures, and electrode maintenance methods for pH measurement have been changed (see 12.2.1, 12.2.8, 12.3, and 12.4). (Versions 11.2.1, 11.2.8, 11.3, and 11.4 of the 2014 edition)
- r) Additional requirements for test water have been added (see 12.2.2, 14.2.6)
- s) The reagent purity requirements for calcium carbonate have been changed (see 14.2.5, 13.2.5 in the 2014 edition);
- t) The procedure for determining total hardness as a calcium ion content has been modified (see 15.3.4, 14.3.4 in the 2014 edition);
- u) A chapter on "Lubrication Performance" has been added (see Chapter 16);
- v) The requirements for high-temperature, high-pressure filtration loss testing of water-based drilling fluids have been changed (see H.2, H.3, H.4, H.5, H.6, I.2, I.3, I.4, I.5). (2014 editions I.2, I.3, I.4, I.5, I.6, J.2, J.3, J.4, J.5)
- w) The recording time points have been changed (see H.4.4.2, I.4.4.2, and I.4.4.2 and