

SLOVENSKI STANDARD
SIST EN ISO 13503-1:2012**01-januar-2012****Nadomešča:****SIST EN ISO 13503-1:2005****SIST EN ISO 13503-1:2005/AC:2008**

Industrija za predelavo nafte in zemeljskega plina - Tekočine in materiali za zaključna dela - 1. del: Merjenje viskoznosti tekočin za zaključna dela (ISO 13503-1:2011)

Petroleum and natural gas industries - Completion fluids and materials - Part 1: Measurement of viscous properties of completion fluids (ISO 13503-1:2011)

Erdöl- und Erdgasindustrie - Komplettierungsflüssigkeiten und Materialien - Teil 1: Messung der Fließeigenschaften von Komplettierungsflüssigkeiten (ISO 13503-1:2011)

Industries du pétrole et du gaz naturel - Fluides de complétion et matériaux - Partie 1: Mesurage des propriétés visqueuses des fluides de complétion (ISO 13503-1:2011)

Ta slovenski standard je istoveten z: EN ISO 13503-1:2011

ICS:

75.100	Maziva	Lubricants, industrial oils and related products
75.180.30	Oprema za merjenje prostornine in merjenje	Volumetric equipment and measurements

SIST EN ISO 13503-1:2012**en,fr**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 13503-1:2012](https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ae-6ef15b14e9a5/sist-en-iso-13503-1-2012)

<https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ae-6ef15b14e9a5/sist-en-iso-13503-1-2012>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 13503-1

November 2011

ICS 75.100

Supersedes EN ISO 13503-1:2005

English Version

Petroleum and natural gas industries - Completion fluids and materials - Part 1: Measurement of viscous properties of completion fluids (ISO 13503-1:2011)

Industries du pétrole et du gaz naturel - Fluides de complétion et matériaux - Partie 1: Mesurage des propriétés visqueuses des fluides de complétion (ISO 13503-1:2011)

Erdöl- und Erdgasindustrie - Komplettierungsflüssigkeiten und Materialien - Teil 1: Messung der Fließeigenschaften von Komplettierungsflüssigkeiten (ISO 13503-1:2011)

This European Standard was approved by CEN on 31 October 2011.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....3

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

[SIST EN ISO 13503-1:2012](https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ae-6ef15b14e9a5/sist-en-iso-13503-1-2012)

<https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ae-6ef15b14e9a5/sist-en-iso-13503-1-2012>

Foreword

This document (EN ISO 13503-1:2011) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" in collaboration with Technical Committee CEN/TC 12 "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2012, and conflicting national standards shall be withdrawn at the latest by May 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 13503-1:2005.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

ITEH STANDARD PREVIEW
(standards.iteh.ai)
Endorsement notice

The text of ISO 13503-1:2011 has been approved by CEN as a EN ISO 13503-1:2011 without any modification.

<https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ac-6ef15b14e9a5/sist-en-iso-13503-1-2012>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 13503-1:2012](https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ae-6ef15b14e9a5/sist-en-iso-13503-1-2012)

<https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ae-6ef15b14e9a5/sist-en-iso-13503-1-2012>

INTERNATIONAL
STANDARD

ISO
13503-1

Second edition
2011-11-01

**Petroleum and natural gas industries —
Completion fluids and materials —**

**Part 1:
Measurement of viscous properties of
completion fluids**

*Industries du pétrole et du gaz naturel — Fluides de complétion et
matériaux — Partie 1: Mesurage des propriétés visqueuses des fluides
de complétion*
iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 13503-1:2012

<https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ae-6ef15b14e9a5/sist-en-iso-13503-1-2012>



Reference number
ISO 13503-1:2011(E)

© ISO 2011

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 13503-1:2012](https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ae-6ef15b14e9a5/sist-en-iso-13503-1-2012)

<https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ae-6ef15b14e9a5/sist-en-iso-13503-1-2012>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2011

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Terms and definitions	1
3 Measurement and precision	2
4 Fluid preparation	2
5 Fluid preparation using shear-history simulation (optional)	3
5.1 General	3
5.2 Requirements for proper shear-history simulation	4
5.3 Conditions for sample delivery	4
5.4 Conditions for standard shear-history simulation	4
5.5 Operational considerations	4
6 Instrument calibration	4
7 Measurement procedures	4
7.1 General	4
7.2 Non-crosslinked fluids (see 2.6)	5
7.3 Crosslinked polymer and surfactant fluids	11
8 Calculation procedures	12
8.1 General concepts	12
8.2 Brief review of geometry-independent rheology versus nominal rheology	13
8.3 Limitations/problems that can produce erroneous results	14
8.4 Calculation method for concentric-cylinder viscometers	14
8.5 Calculations for optional shear-history simulation	16
9 Test report	18
Bibliography	20

ISO 13503-1:2011(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13503-1 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 3, *Drilling and completion fluids, and well cements*.

This second edition cancels and replaces the first edition (ISO 13503-1:2003), which has been technically revised. It also incorporates the Technical Corrigendum ISO 13503-1:2003/Cor.1:2005.

ISO 13503 consists of the following parts, under the general title *Petroleum and natural gas industries — Completion fluids and materials*:

- Part 1: *Measurement of viscous properties of completion fluids*
- Part 2: *Measurement of properties of proppants used in hydraulic fracturing and gravel-packing operations*
- Part 3: *Testing of heavy brines*
- Part 4: *Procedure for measuring stimulation and gravel-pack fluid leakoff under static conditions*
- Part 5: *Procedures for measuring the long-term conductivity of proppants*
- Part 6: *Procedure for measuring leakoff of completion fluids under dynamic conditions*

Introduction

For the purposes of this part of ISO 13503, completion fluids are defined as viscosified treating fluids used during the completion or workover of a petroleum- or natural-gas-producing well. The objective of this part of ISO 13503 is to provide a standard procedure for measuring the viscous properties of single-phase, non-particulate-laden completion fluids. These fluids are viscosified brines, gravel-pack carrier fluids, and fracturing fluids. These fluids can be either crosslinked or non-crosslinked (aqueous, hydrocarbon- or acid-based).

An optional shear-history simulation procedure is provided for fluids that are potentially shear-sensitive. This procedure is designed to simulate the shearing effects experienced by a fluid in surface apparatus and during the time it is being conveyed down the wellbore. Shear-history simulation is most often used during the development of new fracturing fluids to characterize their sensitivity to shear.

These standard procedures were compiled on the basis of several years of comparative testing, debate, discussion, and continued research by the industry.

This standard procedure is largely based on API RP 13M, first edition, July 2004.

In this part of ISO 13503, where practical, US Customary units (USC) are included in parentheses for convenience.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 13503-1:2012](https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ae-6ef15b14e9a5/sist-en-iso-13503-1-2012)

<https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ae-6ef15b14e9a5/sist-en-iso-13503-1-2012>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 13503-1:2012](https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ae-6ef15b14e9a5/sist-en-iso-13503-1-2012)

<https://standards.iteh.ai/catalog/standards/sist/1c167ac8-c59e-4b89-a9ae-6ef15b14e9a5/sist-en-iso-13503-1-2012>