SLOVENSKI STANDARD
SIST EN ISO 10414-2:2011

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Industrija za predelavo nafte in zemeljskega plina - Preskušanje vrtalnih tekočin na terenu (in situ) - 2. del: Tekočine na oljni osnovi (ISO 10414-2:2011)

Petroleum and natural gas industries - Field testing of drilling fluids - Part 2: Oil-based fluids (ISO 10414-2:2011)

Erdöl- und Erdgasindustrie - Feldprüfung von Bohrflüssigkeiten - Teil 2: Flüssigkeiten auf Ölbasis (ISO 10414-2:2011)

Industries du pétrole et du gaz naturel - Essais in situ des fluides de forage - Partie 2: Fluides à base d'huiles (ISO 10414-2:2011)

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ICS:

75.180.10	Oprema za raziskovanje in odkopavanje	Exploratory and extraction equipment

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 10414-2

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English Version

Petroleum and natural gas industries - Field testing of drilling fluids - Part 2: Oil-based fluids (ISO 10414-2:2011)

Industries du pétrole et du gaz naturel - Essais in situ des fluides de forage - Partie 2: Fluides à base d'huiles (ISO 10414-2:2011)

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN ISO 10414-2:2011) 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of an identical text or by endorsement, at the latest by December 2011, and conflicting national standards shall be withdrawn at the latest by December 2011.

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Endorsement notice

The text of ISO 10414-2:2011 has been approved by CEN as a EN ISO 10414-2:2011 without any modification.

INTERNATIONAL STANDARD

ISO 10414-2

Second edition
2011-06-15

Petroleum and natural gas industries — Field testing of drilling fluids —

Part 2: Oil-based fluids

Industries du pétrole et du gaz naturel — Essais in situ des fluides de forage —
Partie 2: Fluides à base d'huiles

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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.

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ISO 10414-2 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for the 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 10414-2:2002), which has been technically revised.

ISO 10414 consists of the following parts, under the general title *Petroleum and natural gas industries — Field testing of drilling fluids*:

— *Part 1: Water-based fluids*

— *Part 2: Oil-based fluids*

Introduction

This part of ISO 10414 is based on API RP 13B-2:2005, *Recommended practice for field testing of oil-based drilling fluids*.

As with any laboratory procedure requiring the use of potentially hazardous chemicals and equipment, the user is expected to have received proper training and knowledge in the use and disposal of these potentially hazardous materials. The user is responsible for compliance with all applicable local, regional and national requirements for worker and local health, safety and environmental liability.

In this part of ISO 10414, quantities expressed in the International System (SI) of units are also, where practical, expressed in United States Customary (USC) units in parentheses for information. The units do not necessarily represent a direct conversion of SI units to USC units, or USC units to SI units. Consideration has been given to the precision of the instrument making the measurement. For example, thermometers are typically marked in one degree increments, thus temperature values have been rounded to the nearest degree.

Calibrating an instrument refers to ensuring the accuracy of the measurement. Accuracy is the degree of conformity of a measurement of a quantity to its actual or true value. Accuracy is related to precision, or reproducibility, of a measurement. Precision is the degree to which further measurements or calculations will show the same or similar results. Precision is characterized in terms of the standard deviation of the measurement. The results of calculations or a measurement can be accurate but not precise, precise but not accurate, neither accurate nor precise, or both accurate and precise. A result is valid if it is both accurate and precise.

Petroleum and natural gas industries — Field testing of drilling fluids —

Part 2: Oil-based fluids

1 Scope

This part of ISO 10414 provides standard procedures for determining the following characteristics of oil-based drilling fluids:

a) drilling fluid density (mud weight);

b) viscosity and gel strength;

c) filtration;

d) oil, water and solids concentrations;

e) alkalinity, chloride concentration and calcium concentration;

f) electrical stability;

g) lime and calcium concentrations, calcium chloride and sodium chloride concentrations;

h) low-gravity solids and weighting material concentrations.

The annexes provide additional test methods or examples that can optionally be used for the determination of:

— shear strength (Annex A);

— oil and water concentrations from cuttings (Annex B);

— drilling fluid activity (Annex C);

— aniline point (Annex D);

— lime, salinity and solids concentration (Annex E);

— sampling, inspection and rejection (Annex F);

— rig-site sampling (Annex G);

— cuttings activity (Annex H);

— active sulphides (Annex I);

— calibration and verification of glassware, thermometers, viscometers, retort kit cups and drilling fluid balances (Annex J);

— permeability plugging apparatus with set-screw secured end cap (Annex K);

— permeability plugging apparatus with threaded end cap (Annex L);

— elastomer compatibility (Annex M);

— sand content of oil-based fluid (Annex N);

— identification and monitoring of weight-material sag (Annex O);

— oil-based drilling fluid test report form (Annex P).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10414-1:2008[1)], *Petroleum and natural gas industries — Field testing of drilling fluids — Part 1: Water-based fluids*

ISO 13501[2)], *Petroleum and natural gas industries — Drilling fluids — Processing equipment evaluation*

API RP 13D:2010, *Recommended practice on the rheology and hydraulics of oil-well drilling fluids*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
ACS reagent grade
grade of chemical meeting the purity standards specified by the American Chemical Society (ACS) and listed in the Chemical Abstracting Service (CAS)

3.2
density of water
density of 1 g/ml (8,334 lb/gal) for deionized or distilled water and 1 g/ml (8,345 lb/gal) for clean tap water

NOTE Deionized or distilled water is used for all equipment calibration. The volume of 1 kg of water is 1 l for the purposes of this part of ISO 10414, and the volume of water is numerically equivalent to the volume of the water measured in cubic centimetres or millilitres, i.e. 1 g = 1 ml.

3.3
spurt loss
volume of fluid that passes through the filtration medium before a filter cake is formed

3.4
pound
U.S. customary unit used to indicate pound-mass (weight), as opposed to pound-force (shear stress)

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1) For the purposes of this part of ISO 10414, API RP 13B-1:2009, *Recommended practice for field testing water-based drilling fluids*, is equivalent.

2) For the purposes of this part of ISO 10414, API RP 13C, *Recommended practice on drilling fluids processing systems evaluation*, is equivalent.

3.5
volumic mass
dimensionless ratio of the mass of a volume of an object substance to the mass of the same volume of a reference substance, i.e. the ratio of their respective mass densities

NOTE 1 Generally speaking, the reference substance is pure water.

NOTE 2 Volumic mass is commonly known as specific gravity.

4 Symbols and abbreviated terms

4.1 Symbols

a_{DF}	measure of the chemical potential or reaction availability of drilling fluid
a_W	measure of the chemical potential or reaction availability of water solutions of standard salts
a_C	measure of the chemical potential or reaction availability of drilled cuttings
b	slope of the annular velocity and shear stress at the wall in laminar flow, as defined in O.7.2.8
B_{VSST}	amount of weight-material sag, expressed in pounds-mass per gallon[3)]
C	correction value to add to thermometer reading
$c_{Ca^{+2},DF}$	whole-drilling-fluid calcium concentration, expressed in milligrams per litre
c_{Ca^{+2},H_2O}	aqueous-phase calcium concentration per volume of pure water, expressed in milligrams per litre
$c_{CaCl_2,AQ}$	aqueous-phase calcium chloride concentration, expressed in milligrams per litre
$c_{CaCl_2,DF,A}$	whole-drilling-fluid calcium chloride concentration, expressed in milligrams per litre
$c_{CaCl_2,DF,B}$	whole-drilling-fluid calcium chloride concentration, expressed in pounds per barrel
$c_{CaCl_2,DF,C}$	whole-drilling-fluid calcium chloride concentration, expressed in kilograms per cubic metre
$c_{Ca(OH)_2,\%}$	lime assay value, expressed as a weight fraction
$c_{Ca(OH)_2,DF,B}$	whole-drilling-fluid total lime concentration, expressed in pounds per barrel
$c_{Ca(OH)_2,DF,C}$	whole-drilling-fluid total lime concentration, expressed in kilograms per cubic metre
$c_{Ca(OH)_2,F}$	lime concentration of field lime, expressed in kilograms per cubic metre or pounds per barrel

3) Gallon as used throughout this part of ISO 10414 refers to the U.S. gallon of 3,785 4 litres.