SLOVENSKI STANDARD
SIST EN ISO 13501:2011

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Nadomešča:
SIST EN ISO 13501:2007

Industrija za predelavo nafte in zemeljskega plina - Vrtalne tekočine - Vrednotenje predelovalne opreme (ISO 13501:2011)

Petroleum and natural gas industries - Drilling fluids - Processing equipment evaluation (ISO 13501:2011)

Erdöl- und Erdgasindustrie - Bohrspülungen - Bewertung von Messgeräten (ISO 13501:2011)

Industries du pétrole et du gaz naturel - Fluides de forage - Évaluation des équipements de traitement (ISO 13501:2011)

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ICS:

75.180.10	Oprema za raziskovanje in odkopavanje	Exploratory and extraction equipment

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EUROPEAN STANDARD

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English Version

Petroleum and natural gas industries - Drilling fluids - Processing equipment evaluation (ISO 13501:2011)

Industries du pétrole et du gaz naturel - Fluides de forage - Évaluation des équipements de traitement (ISO 13501:2011)

Erdöl- und Erdgasindustrie - Bohrspülungen - Bewertung von Messgeräten (ISO 13501:2011)

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN ISO 13501:2011) 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of an identical text or by endorsement, at the latest by December 2011, and conflicting national standards shall be withdrawn at the latest by December 2011.

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The text of ISO 13501:2011 has been approved by CEN as a EN ISO 13501:2011 without any modification.

INTERNATIONAL STANDARD

ISO 13501

Second edition
2011-06-15

Petroleum and natural gas industries — Drilling fluids — Processing equipment evaluation

Industries du pétrole et du gaz naturel — Fluides de forage — Évaluation des équipements de traitement

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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.

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 13501 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 13501:2005), which has been technically revised.

The main changes compared with the first edition are as follows:

— Clause 11 specifies a different labelling requirement for shale shaker screens that are permanently attached to the screen, and also covers the marking of shipping containers for shale shaker screens;

— Annex B describes a standard procedure for the quick assessment of a solids control screen sizing, which can be used in the field or laboratory for identification of an unknown screen approximate size range.

NOTE The procedure described in Annex B is provided for information only and does not replace or supplement the normative testing in accordance with Clauses 9, 10 and 11, nor is it intended for the operating comparison or ranking of similar types of individual pieces of equipment.

Introduction

This International Standard is based on API RP 13C, 3rd edition, December 2004 (for drilling fluid processing equipment) and shale shaker screen API RP 13E, 3rd edition, May 1993 (for shale shaker screens).

The purpose of this International Standard is to provide a method of assessing the performance of solids control equipment systems in the field. It includes procedures for evaluation of shale shakers, centrifugal pumps, degassers, hydrocyclones, mud cleaners and centrifuges, as well as an entire system evaluation. Shale shaker screen labelling and separation potential of shale shaker screens have been addressed within this International Standard.

This International Standard covers equipment which is commonly used in petroleum and natural gas drilling fluids processing. This equipment can be purchased or rented from multiple sources, and is available worldwide. No single-source or limited-source equipment is included, either by inference or reference.

In this International Standard, quantities expressed in the International System (SI) of units are also, where practical, expressed in United States Customary (USC) units for information.

NOTE The units do not necessarily represent a direct conversion of SI units to USC units, or of 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.

This International Standard refers to assuring the accuracy of the measurement. Accuracy is the degree of conformity of a measurement of a quantity to the 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 result of calculation or a measurement can be accurate, but not precise, precise but not accurate, neither or both. A result is valid if it is both accurate and precise.

Users of this International Standard should be aware that further or differing requirements may be needed for individual applications. This International Standard is not intended to inhibit a vendor from offering, or the purchaser from accepting, alternative equipment or engineering solutions for the individual application. This may be particularly applicable where there is innovative or developing technology. Where an alternative is offered, the vendor should identify any variations from this International Standard and provide details.

Petroleum and natural gas industries — Drilling fluids — Processing equipment evaluation

1 Scope

This International Standard specifies a standard procedure for assessing and modifying the performance of solids control equipment systems commonly used in the field in petroleum and natural gas drilling fluids processing.

The procedure described in this International Standard is not intended for the comparison of similar types of individual pieces of equipment.

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 3310-1[1)], *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

ISO 10414-1[2)], *Petroleum and natural gas industries — Field testing of drilling fluids — Part 1: Water-based fluids*

ISO 10414-2[3)], *Petroleum and natural gas industries — Field testing of drilling fluids — Part 2: Oil-based fluids*

ANSI/AWWA C700, *Cold-Water Meters — Displacement Type, Bronze Main Case*

API, *Manual of Petroleum Measurement Standards*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

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

3.1.1
addition section
compartment(s) in the surface drilling fluid system, between the removal section and the suction section, which provides (a) well-agitated compartment(s) for the addition of commercial products such as chemicals, necessary solids and liquids

1) For the purposes of this International Standard, ASTM E11-95 is equivalent to ISO 3310-1.

2) For the purposes of this International Standard, API RP 13B-1 is equivalent to ISO 10414-1.

3) For the purposes of this International Standard, API RP 13B-2 is equivalent to ISO 10414-2.

3.1.2
agitator
mechanical stirrer
mechanically driven mixer that stirs the drilling fluid, by turning an impeller near the bottom of a mud compartment to blend additives, suspend solids and maintain a uniform consistency of the drilling fluid

3.1.3
aperture
⟨screen cloth⟩ opening between the wires in a screen cloth

3.1.4
aperture
⟨screen surface⟩ opening in a screen surface

3.1.5
apex
opening at lower end of a hydrocyclone

3.1.6
API sand
⟨physical description⟩ particles in a drilling fluid that are too large to pass through a 74 µm sieve (API 200 screen)

NOTE 1 Its amount is expressed as a volume fraction (percent) of drilling fluid.

NOTE 2 Particle size is a descriptive term; the particles can be shale, limestone, wood, gold or any other material.

3.1.7
API screen number
number in an API system used to designate the D100 separation range of a mesh screen cloth

NOTE 1 Both mesh and mesh count are obsolete terms, and have been replaced by the API screen number.

NOTE 2 The term “mesh” was formerly used to refer to the number of openings (and fraction thereof) per linear inch in a screen, counted in both directions from the centre of a wire.

NOTE 3 The term “mesh count” was formerly used to describe the fineness of a square or rectangular mesh screen cloth, e.g. a mesh count such as 30×30 (or, often, 30 mesh) indicates a square mesh, while a designation such as 70×30 mesh indicates a rectangular mesh.

NOTE 4 See 9.6 for further information.

3.1.8
backing plate
support plate attached to the back of screen cloth(s)

3.1.9
baffle
plate or obstruction built into a compartment to change the direction of fluid flow

3.1.10
barite
baryte
natural barium sulfate ($BaSO_4$) used for increasing the density of drilling fluids

NOTE The standard international requirement is for a minimum specific gravity of 4,20 or 4,10 for two grades of barite, but there is no specification that the material must be barium sulfate. Commercial ISO 13500 barite can be produced from a single ore or a blend of ores, and can be a straight-mined product or processed by flotation methods. It can contain accessory minerals other than barium sulfate ($BaSO_4$). Because of mineral impurities, commercial barite can vary in colour from off-white to grey to red or brown. Common accessory minerals are silicates such as quartz and chert, carbonate compounds such as siderite and dolomite, and metallic oxide and sulfide compounds.

3.1.11
blinding
reduction of open area in a screening surface caused by coating or plugging

3.1.12
bonding material
material used to secure screen cloth to a backing plate or support screen

3.1.13
capture
mass fraction of incoming suspended solids that are conveyed to the reject stream

NOTE See Clause 6.

3.1.14
centrifugal pump
machine for moving fluid by spinning it using a rotating impeller in a casing with a central inlet and a tangential outlet

NOTE The path of the fluid is an increasing spiral from the inlet at the centre to the outlet, tangent to the impeller annulus. In the annular space between the impeller vane tips and the casing wall, the fluid velocity is roughly the same as that of the impeller vane tips. Useful work is produced by the pump when some of the spinning fluid flows out of the casing tangential outlet into the pipe system. Power from the motor is used to accelerate the fluid entering the inlet up to the speed of the fluid in the annulus. Some of the motor power is expended as friction of the fluid in the casing and impeller.

3.1.15
centrifuge

device, rotated by an external force, for the purpose of separating materials of various masses (depending upon specific gravity and particle sizes) from a slurry to which the rotation is imparted primarily by the rotating containing walls

NOTE In a weighted drilling fluid, a centrifuge is usually used to eliminate colloidal solids.

3.1.16
check section
suction section
last active section in the surface system which provides a location for rig pump and mud hopper suction, and ideally is large enough to check and adjust drilling fluid properties before the drilling fluid is pumped downhole

3.1.17
clay mineral
soft, variously coloured earth, commonly hydrous silicate of alumina

NOTE Clay minerals are essentially insoluble in water, but disperse under hydration, grinding, heating or velocity effects. Particle sizes of clay mineral can vary from sub-micrometre to larger than 100 µm.

3.1.18
clay particle
colloidal particles of clay mineral having less than 2 µm equivalent spherical diameter

NOTE See **colloidal solid** (3.1.21).

3.1.19
coating
⟨substance⟩ material adhering to a surface to change the properties of the surface

NOTE See **blinding** (3.1.11).