



SLOVENSKI STANDARD SIST EN ISO 13500:2006

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Oil and natural gas industries - Drilling fluid materials - Specifications and tests (ISO 13500:2006)

Petroleum and natural gas industries - Drilling fluid materials - Specifications and tests (ISO 13500:2006)

Erdöl- und Erdgasindustrie - Bohrspülungen - Spezifikationen und Prüfungen (ISO 13500:2006)

Industries du pétrole et du gaz naturel - Produits pour fluides de forage - Spécifications et essais (ISO 13500:2006)

Ta slovenski standard je istoveten z: EN ISO 13500:2006

ICS:

75.180.10	Oprema za raziskovanje in odkopavanje	Exploratory and extraction equipment
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**Petroleum and natural gas industries - Drilling fluid materials -
Specifications and tests (ISO 13500:2006)**

Industries du pétrole et du gaz naturel - Produits pour
fluides de forage - Spécifications et essais (ISO
13500:2006)

Erdöl- und Erdgasindustrie - Bohrspülungen -
Spezifikationen und Prüfungen (ISO 13500:2006)

This European Standard was approved by CEN on 23 January 2006.

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COMITÉ EUROPÉEN DE NORMALISATION
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EN ISO 13500:2006 (E)**Foreword**

This document (EN ISO 13500:2006) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum 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of an identical text or by endorsement, at the latest by August 2006, and conflicting national standards shall be withdrawn at the latest by August 2006.

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Petroleum and natural gas industries — Drilling fluid materials — Specifications and tests

*Industries du pétrole et du gaz naturel — Produits pour fluides de
forage — Spécifications et essais*

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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 13500 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*.

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This second edition cancels and replaces the first edition (ISO 13500:1998), which has been technically revised.

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Introduction

This International Standard covers materials which are in common usage in petroleum and natural gas drilling fluids. These materials are used in bulk quantities, can be purchased from multiple sources, and are available as commodity products. No single-source or limited-source products are included, nor are speciality products.

International Standards are published to facilitate communication between purchasers and manufacturers, to provide interchangeability between similar equipment and materials purchased from different manufacturers and/or at different times, and to provide an adequate level of safety when the equipment or materials are utilised in the manner and for the purposes intended. This International Standard provides minimum requirements and is not intended to inhibit anyone from purchasing or producing materials to other standards.

This International Standard is substantially based on API Spec 13A, 16th Edition, December 1, 2003. The purpose of this International Standard is to provide product specifications for barite, haematite, bentonite, nontreated bentonite, Oil Companies Materials Association (OCMA) grade bentonite, attapulgite, sepiolite, technical-grade low viscosity carboxymethylcellulose (CMC-LVT), technical-grade high viscosity carboxymethylcellulose (CMC-HVT), and starch.

The intent of the document was to incorporate all International Standards for drilling fluid materials into an ISO-formatted document. A survey of the industry found that only the American Petroleum Institute (API) issued testing procedures and specification standards for these materials.

Reference to OCMA materials has been included in API work, as the OCMA and subsequent holding committees were declared defunct, and all specifications were submitted to API in 1983.

Annex A (informative) lists the mineral impurities in barite, Annex B (informative) provides the test precision and Annex C (informative) details examples of calculations.

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Petroleum and natural gas industries — Drilling fluid materials — Specifications and tests

1 Scope

This International Standard covers physical properties and test procedures for materials manufactured for use in oil- and gas-well drilling fluids. The materials covered are barite, haematite, bentonite, nontreated bentonite, OCMA grade bentonite, attapulgite, sepiolite, technical grade low-viscosity carboxymethylcellulose (CMC-LVT), technical grade high-viscosity carboxymethylcellulose (CMC-HVT), and starch. This International Standard is intended for the use of manufacturers of named products.

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 6780, *Flat pallets for intercontinental materials handling — Principal dimensions and tolerances*

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

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ASTM D422, *Standard Test Method for Particle-Size Analysis of Soils*

ASTM E11, *Standard Specification for Wire Cloth and Sieves for Testing Purposes*

ASTM E161, *Standard Specification for Precision Electroformed Sieves*

ASTM E77, *Standard Test Method for Inspection and Verification of Thermometers*

ASTM E177, *Standard Practice for Use of the Terms Precision and Bias in ASTM Test Methods*

NIST (NBS) Monograph 150, *Liquid-in-glass thermometry*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

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

3.1.1

ACS reagent grade

chemicals which meet purity standards as specified by the American Chemical Society (ACS)

3.1.2

flash side

side containing residue (“flash”) from stamping, or the side with concave indentation

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3.2 Symbols and abbreviations

ACS	American Chemical Society
API	American Petroleum Institute
APME	Association of Plastic Manufacturers in Europe
ASTM	American Society for Testing and Materials
EDTA	Ethylenediaminetetraacetic acid
CAS	Chemical Abstracts Service
CMC-HVT	Carboxymethylcellulose — High viscosity technical grade
CMC-LVT	Carboxymethylcellulose — Low viscosity technical grade
OCMA	Oil Companies Materials Association
NBS	National Bureau of Standards
NIST	National Institute of Standards and Technology
TC	To contain
TD	To deliver
b	point/plastic viscosity ratio;
B_c	hydrometer correction intercept;
C_c	calibration correction;
C_m	40 times the EDTA volume, expressed in centimetres;
d	inner diameter;
D_e	equivalent spherical diameter, expressed in micrometres;
D_2	equivalent particle diameter immediately greater than 6 μm ;
D_3	equivalent particle diameter immediately less than 6 μm ;
K_s	sample constant;
L	effective hydrometer depth, in centimetres (see Table 4);
m	sample mass, expressed in grams;
m_1	soluble alkaline earth metals as calcium, expressed in milligrams per kilogram;
m_2	residue mass, expressed in grams;
M_c	hydrometer correction curve slope;
R	average hydrometer reading;
R_1	average hydrometer reading at lower temperature;

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R_2	average hydrometer reading at higher temperature;
R_3	hydrometer reading;
S_c	corrected test value;
S_s	sample test value;
t	time;
V_c	filtrate volume, in cubic centimetres, collected between 7,5 min and 30 min;
V_1	initial volume, expressed in cubic centimetres;
V_2	final volume, expressed in cubic centimetres;
V_3	volume EDTA used, expressed in cubic centimetres;
V_4	volume of filtrate used, expressed in cubic centimetres;
w_a	cumulative percent finer than size;
w_1	mass fraction residue of particles greater than 75 μm , expressed in percent;
w_2	cumulative percent for point immediately greater than 6 μm ;
w_3	cumulative percent for point immediately less than 6 μm ;
w_4	cumulative percent of particles less than 6 μm ;
w_5	mass fraction of residue of particles greater than 45 μm , expressed in percent;
w_6	cumulative percent less than 6 μm ;
w_7	mass fraction of moisture, expressed in percent;
η	water viscosity, expressed in millipascals-seconds;
η_P	plastic viscosity, in millipascal-seconds;
η_Y	yield point, Pa (lb/100 ft ²);
θ	temperature reading;
θ_1	average temperature reading at lower temperature;
θ_2	average temperature reading at higher temperature;
ρ	density, expressed in grams per cubic centimetre.