

SLOVENSKI STANDARD
oSIST prEN ISO 10426-2:2010
01-maj-2010

Industrija za predelavo nafte in zemeljskega plina – Cementi in materiali za cementiranje vrtin – 2. del: Preskušanje cementov za vrtine (ISO/DIS 10426-2:2010)

Petroleum and natural gas industries - Cements and materials for well cementing - Part 2: Testing of well cements (ISO/DIS 10426-2:2010)

Erdöl- und Erdgasindustrie - Zemente und Materialien für die Zementation von Tiefbohrungen - Teil 2: Prüfung von Bohrloch-Zemente (ISO/DIS 10426-2:2010)

Industries du pétrole et du gaz naturel - Ciments et matériaux pour la cimentation des puits - Partie 2: Essais de ciment pour puits (ISO/DIS 10426-2:2010)

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Ta slovenski standard je istoveten z: prEN ISO 10426-2

ICS:

75.180.10	Oprema za raziskovanje in odkopavanje	Exploratory and extraction equipment
91.100.10	Cement. Mavec. Apno. Malta	Cement. Gypsum. Lime. Mortar

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en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
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March 2010

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Will supersede EN ISO 10426-2:2003

English Version

**Petroleum and natural gas industries - Cements and materials
for well cementing - Part 2: Testing of well cements (ISO/DIS
10426-2:2010)**

Industries du pétrole et du gaz naturel - Ciments et
matériaux pour la cimentation des puits - Partie 2: Essais
de ciment pour puits (ISO/DIS 10426-2:2010)

Erdöl- und Erdgasindustrie - Zemente und Materialien für
die Zementation von Tiefbohrungen - Teil 2: Prüfung von
Bohrloch-Zemente (ISO/DIS 10426-2:2010)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 12.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (prEN ISO 10426-2:2010) 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 document is currently submitted to the parallel Enquiry.

This document will supersede EN ISO 10426-2:2003.

Endorsement notice

The text of ISO/DIS 10426-2:2010 has been approved by CEN as a prEN ISO 10426-2:2010 without any modification.

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ISO/TC 67/SC 3

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Petroleum and natural gas industries — Cements and materials for well cementing —

Part 2: Testing of well cements

*Industries du pétrole et du gaz naturel — Ciments et matériaux pour la cimentation des puits —
Partie 2: Essais de ciment pour puits*

(Revision of first edition of ISO 10426-2:2003, of ISO 10426-2:2003/Cor.1:2006 and of ISO 10426-2:2003/Amd.1:2005)

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ICS 75.020; 91.100.10

oSIST prEN ISO 10426-2:2010

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO-lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

In accordance with the provisions of Council Resolution 15/1993 this document is circulated in the English language only.

Conformément aux dispositions de la Résolution du Conseil 15/1993, ce document est distribué en version anglaise seulement.

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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 10426-2 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, which has been technically revised.

ISO 10426 consists of the following parts, under the general title *Petroleum and natural gas industries — Cements and materials for well cementing*:

- Part 1: *Specification*
- Part 2: *Testing of well cements*
- Part 3: *Testing of deepwater well cement formulations*
- Part 4: *Preparation and testing of foamed cement slurries at atmospheric pressure*
- Part 5: *Determination of shrinkage and expansion of well cement formulations at atmospheric pressure*
- Part 6: *Methods for determining the static gel strength of cement formulations*

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Introduction

Users of this part of ISO 10426 should be aware that further or differing requirements may be needed for individual applications. This part of ISO 10426 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 part of ISO 10426 and provide details.

In this part of ISO 10426, where practical, US Customary units are included in brackets for information. The units do not necessarily represent a direct conversion of SI to US Customary units, or US Customary to SI. 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.

In this part of ISO 10426, calibrating an instrument refers to assuring 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 and both. A result is valid if it is both accurate and precise.

Well cement classes and grades are defined in ISO 10426-1.

WARNING — This procedure requires the handling of hot, pressurized equipment and materials that may be hazardous and can cause injury. Do not exceed manufacturer's safety limits. Only trained personnel should perform these tests.

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Petroleum and natural gas industries — Cements and materials for well cementing — Part 2: Testing of well cements

1 Scope

This part of ISO 10426 specifies methods and gives recommendations for the testing of cement slurries and related materials under simulated well conditions.

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

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

ISO 10426-1, *Petroleum and natural gas industries — Cements and materials for well cementing — Part 1: Specification*

ISO 13503-3, *Petroleum and natural gas industries — Completion fluids and materials — Part 3: Testing of heavy brines*

ASTM C 109/C 109M-07, *Standard test method for compressive strength of hydraulic cement mortars (using 2 in. or [50 mm] cube specimens)*

ASTM C 188-95, *Standard test method for density of hydraulic cement*

ASTM C 618-08, *Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete*

ASTM E 220-07a, *Standard Test Method for Calibration of Thermocouples by Comparison Techniques*

3 Terms, definitions, and symbols

3.1 Terms and definitions

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

3.1.1

absolute density

density of a material without the fluid around the particles. It is similar to the relative density and can be obtained by multiplying the relative density of a material by the density of water at 4 °C, 1000 kg/m³ (8,345 4 lbm/gal)

3.1.2

absolute volume

reciprocal of absolute density

3.1.3**additive**

material added to a cement slurry to modify or enhance some desired property

3.1.4**annulus**

space between the pipe and the wellbore wall or an outer pipe

3.1.5**batch mix**

process of mixing the entire volume of cement slurry prior to placement in the wellbore

3.1.6**Bearden units of consistency**

B_c

units used to express consistency of a cement slurry when determined using a pressurized consistometer

3.1.7**bottomhole circulating temperature (T_{BHC})**

temperature found at the bottom of the wellbore while the well is being circulated

3.1.8**bulk density**

mass per unit volume of a dry material including the air between particles

3.1.9**casing cementing**

process of placing cement to fill or partially fill the space between a full string of casing and the wellbore

3.1.10**cement****Portland cement**

material formed by the grinding of clinker generally consisting of hydraulic calcium silicates and aluminates and usually containing one or more of the forms of calcium sulfate added during grinding

3.1.11**cement blend**

mixture of dry cement and other dry materials

3.1.12**cement class**

designation under the ISO system of classifications of well cement according to defined specifications of ISO 10426-1

3.1.13**cement grade**

designation under the ISO system for denoting the sulfate resistance of a particular cement according to specifications of ISO 10426-1

3.1.14**clinker**

fused materials from the kiln that are interground with calcium sulfate to manufacture cement

3.1.15**compatibility**

capacity to form a fluid mixture that does not undergo undesirable chemical and/or physical reactions