# Petroleum and natural gas industries - Cements and materials for well cementing - Part 1: Specification

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**EESTI STANDARDI EESSÕNA** **NATIONAL FOREWORD**

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| Käesolev Eesti standard EVS-EN ISO 10426-1:2006 sisaldab Euroopa standardi EN ISO 10426-1:2006 ingliskeelset teksti.<br><br>Käesolev dokument on jõustatud 24.11.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.<br><br>Standard on kättesaadav Eesti standardiorganisatsioonist. | This Estonian standard EVS-EN ISO 10426-1:2006 consists of the English text of the European standard EN ISO 10426-1:2006.<br><br>This document is endorsed on 24.11.2006 with the notification being published in the official publication of the Estonian national standardisation organisation.<br><br>The standard is available from Estonian standardisation organisation. |

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|---|---|
| **Käsitlusala:**<br>This part of ISO 10426 specifies requirements and gives recommendations for eight classes of well cements, including their chemical and physical requirements and procedures for physical testing. This part of ISO 10426 is applicable to well cement classes A, B, C, D, E and F, which are the products obtained by grinding Portland cement clinker and, if needed, calcium sulfate as an interground additive. | **Scope:**<br>This part of ISO 10426 specifies requirements and gives recommendations for eight classes of well cements, including their chemical and physical requirements and procedures for physical testing. This part of ISO 10426 is applicable to well cement classes A, B, C, D, E and F, which are the products obtained by grinding Portland cement clinker and, if needed, calcium sulfate as an interground additive. |

**ICS** 75.020, 91.100.10

**Võtmesõnad:**

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# EN ISO 10426-1

October 2006

ICS 91.100.10; 75.020

Supersedes EN ISO 10426-1:2000

English Version

# Petroleum and natural gas industries - Cements and materials for well cementing - Part 1: Specification (ISO 10426-1:2005)

Industries du pétrole et du gaz naturel - Ciments et matériaux pour la cimentation des puits -- Partie 1: Spécifications (ISO 10426-1:2005)

Erdöl- und Erdgasindustrie - Zemente und Materialien für die Zementation von Tieflochbohrungen - Teil 1: Anforderungen (ISO 10426-1:2005)

This European Standard was approved by CEN on 6 October 2006.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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Ref. No. EN ISO 10426-1:2006: E

## Foreword

The text of ISO 10426-1:2005 has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum and natural gas industries" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 10426-1:2006 by 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 April 2007, and conflicting national standards shall be withdrawn at the latest by April 2007.

This document supersedes EN ISO 10426-1:2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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.

### Endorsement notice

The text of ISO 10426-1:2005 has been approved by CEN as EN ISO 10426-1:2006 without any modifications.

INTERNATIONAL STANDARD

**ISO 10426-1**

Second edition
2005-12-15

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

## Part 1: Specification

*Industries du pétrole et du gaz naturel — Ciments et matériaux pour la cimentation des puits —*

*Partie 1: Spécifications*



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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 10426-1 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 10426-1:2000), of which has it constitutes a minor revision. It also incorporates the Amendment ISO 10426-1:2000/Amd.1:2002.

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 cement*

— *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*

A future Part 6, describing methods for determining the static gel strength of cement formulations, is under preparation.



 

# Introduction

The first edition of this part of ISO 10426 was based on API Specification 10A, 22nd edition, January 1995. This was in turn adopted by API as API Specification 10A, 23rd edition, April 2002. This second edition of this part of ISO 10426 incorporates ISO 10426-1:2000/Amendment 1:2002 with the intent that the 24th edition of API Specification 10A will be identical to this part of ISO 10426.

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, U.S. Customary units are included in brackets for information.

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

## Part 1: Specification



## 1 Scope

This part of ISO 10426 specifies requirements and gives recommendations for eight classes of well cements, including their chemical and physical requirements and procedures for physical testing.

This part of ISO 10426 is applicable to well cement classes A, B, C, D, E and F, which are the products obtained by grinding Portland cement clinker and, if needed, calcium sulfate as an interground additive. Processing additives can be used in the manufacture of cement of these classes. Suitable set-modifying agents can be interground or blended during manufacture of classes D, E and F.

This part of ISO 10426 is also applicable to well cement classes G and H, which are the products obtained by grinding Portland cement clinker with no additives other than calcium sulfate or water.

## 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, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

ISO 13500, *Petroleum and natural gas industries — Drilling fluid materials — Specifications and tests*

ASTM C109/C109M, *Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in or [50-mm] Cube Specimens)*

ASTM C114, *Standard Test Methods for Chemical Analysis of Hydraulic Cement*

ASTM C115, *Standard Test Methods for Fineness of Portland Cement by the Turbidimeter*

ASTM C183, *Standard Practice for Sampling and the Amount of Testing of Hydraulic Cement*

ASTM C204, *Standard Test Method for Fineness of Hydraulic Cement by Air Permeability Apparatus*

ASTM C465, *Standard Specification for Processing Additions for Use in the Manufacture of Hydraulic Cements*

ASTM E220, *Standard Test Method for Calibration of Thermocouples by Comparison Techniques*

ASTM E1404, *Standard Specification for Laboratory Class Conical Flasks*

DIN 12385, *Laboratory glassware, conical flasks, wide neck*

EN 196-2, *Methods of testing cement — Part 2: Chemical analysis of cement*

EN 196-6, *Methods of testing cement — Part 6: Determination of fineness*

EN 196-7, *Methods of testing cement — Part 7: Methods of taking and preparing samples of cement*

## 3 Terms and definitions

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

**3.1**
**additive**
material added to a cement slurry to modify or enhance some desired property

NOTE Properties that are commonly modified include: setting time (by use of retarders or accelerators), fluid loss, viscosity, etc.

**3.2**
**Bearden unit of consistency**
$B_c$
measure of the consistency of a cement slurry when determined on a pressurized consistometer

**3.3**
**bulk density**
mass per unit volume of a dry material containing entrained air

**3.4**
**cement**
**Portland cement**
ground clinker generally consisting of hydraulic calcium silicates and aluminates and usually containing one or more forms of calcium sulfate as an interground additive

**3.5**
**cement class**
designation achieved using the ISO system of classification of well cement according to its intended use

**3.6**
**cement grade**
designation achieved using the ISO system for denoting the sulfate resistance of a particular cement

**3.7**
**cement blend**
mixture of dry cement and other dry materials

**3.8**
**clinker**
fused materials from the kiln in cement manufacturing that are interground with calcium sulfate to make cement

**3.9**
**compressive strength**
force per unit area required to crush a set cement sample

**3.10**
**consistometer**
device used to measure the thickening time of a cement slurry under temperature and pressure