

# SLOVENSKI STANDARD

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Nadomešča:

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**Industrija za predelavo nafte in zemeljskega plina - Cementi in materiali za cementiranje vrtin - 1. del: Specifikacija (ISO 10426-1:2005)**

Petroleum and natural gas industries - Cements and materials for well cementing - Part 1: Specification (ISO 10426-1:2006)

**iTeh STANDARD PREVIEW**

Erdöl- und Erdgasindustrie - Zemente und Materialien für die Zementation von Tieflochbohrungen - Teil 1: Anforderungen (ISO 10426-1:2006)

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Industries du pétrole et du gaz naturel - Ciments et matériaux pour la cimentation des puits -- Partie 1: Spécifications (ISO 10426-1:2006)

**Ta slovenski standard je istoveten z: EN ISO 10426-1:2006**

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**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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EUROPEAN STANDARD  
NORME EUROPÉENNE  
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**EN ISO 10426-1**

October 2006

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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.

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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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**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.

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

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2005-12-15

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

**Part 1:  
Specification**

**iTeh STANDARD PREVIEW**

*Industries du pétrole et du gaz naturel — Ciments et matériaux pour la  
cimentation des puits*  
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*Partie 1: Spécifications*

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**ISO 10426-1:2005(E)****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*.

**iTeh STANDARD PREVIEW**

This second edition cancels and replaces the first edition (ISO 10426-1:2000), of which 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.

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# 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*

**ISO 10426-1:2005(E)**

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

**3.11****filtrate**

liquid that is forced out of a cement slurry during a fluid loss test

**3.12****free fluid**

coloured or colourless liquid which has separated from a cement slurry

**3.13****neat cement slurry**

cement slurry consisting of only cement and water

**3.14****pressure vessel**

vessel in a consistometer into which the slurry container is placed for the thickening time test

**3.15****slurry container****slurry cup**

container in a pressurized consistometer used to hold the slurry for conditioning purposes or for the thickening time test

**3.16****thickening time**

time for a cement slurry to develop a selected  $B_c$

NOTE The results of a thickening time test provide an indication of the length of time a cement slurry remains pumpable under the test conditions.

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**4 Requirements**

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**4.1 Specification, chemical and physical requirements****4.1.1 Classes and grades**

Well cement shall be specified using the following Classes (A, B, C, D, E, F, G and H) and Grades (O, MSR and HSR).

A processing additive or set-modifying agent shall not prevent a well cement from performing its intended functions.

**a) Class A**

The product obtained by grinding Portland cement clinker, consisting essentially of hydraulic calcium silicates, usually containing one or more forms of calcium sulfate as an interground additive. At the option of the manufacturer, processing additives may be used in the manufacture of Class A cement, provided such materials in the amounts used have been shown to meet the requirements of ASTM C465.

This product is intended for use when special properties are not required and is available only in ordinary (O) grade (similar to ASTM C150, Type I).

**b) Class B**

The product obtained by grinding Portland cement clinker, consisting essentially of hydraulic calcium silicates, usually containing one or more forms of calcium sulfate as an interground additive. At the option of the manufacturer, processing additives may be used in the manufacture of Class B cement, provided such materials in the amounts used have been shown to meet the requirements of ASTM C465.