

**Petroleum, petrochemical and natural gas  
industries - Reciprocating positive  
displacement pumps**

Petroleum, petrochemical and natural gas industries  
- Reciprocating positive displacement pumps

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 13710:2004 sisaldab Euroopa standardi EN ISO 13710:2004 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 26.10.2004 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 13710:2004 consists of the English text of the European standard EN ISO 13710:2004.</p> <p>This document is endorsed on 26.10.2004 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b></p> <p>This International Standard specifies requirements for reciprocating positive-displacement pumps and pump units for use in the petroleum, petrochemical and natural gas industries. It is applicable to both direct-acting and power-frame types. This International Standard is not applicable to controlled-volume pumps and rotary pumps.</p>	<p><b>Scope:</b></p> <p>This International Standard specifies requirements for reciprocating positive-displacement pumps and pump units for use in the petroleum, petrochemical and natural gas industries. It is applicable to both direct-acting and power-frame types. This International Standard is not applicable to controlled-volume pumps and rotary pumps.</p>
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Võtmesõnad:

English version

Petroleum, petrochemical and natural gas industries -  
Reciprocating positive displacement pumps (ISO 13710:2004)

Industries pétrolière, pétrochimique et du gaz naturel -  
Pompes volumétriques alternatives (ISO 13710:2004)

Erdöl-, petrochemische und Erdgasindustrie —  
Oszillierende Verdrängerpumpen (ISO 13710:2004)

This European Standard was approved by CEN on 1 June 2004.

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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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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
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## Foreword

This document (EN ISO 13710:2004) has been prepared by Technical Committee ISO/TC 115 „Pumps“ 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 January 2005, and conflicting national standards shall be withdrawn at the latest by January 2005.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

## Endorsement notice

The text of ISO 13710:2004 has been approved by CEN as EN ISO 13710:2004 without any modifications.

## Introduction

This International Standard was developed from API Std 674, 2nd edition, 1995, with the intent that the 3rd edition of API Std 674 will be the same as this International Standard.

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 appropriate 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.

This International Standard requires the purchaser to specify certain details and features.

A bullet (•) at the beginning of a paragraph indicates that either a decision is required or further information is to be provided by the purchaser. This information should be shown on data sheets or stated in the enquiry or purchase order (see examples in Annex D).

In this International Standard, where practical, US Customary (USC) units are included in brackets for information.

Annex A lists typical materials standards used in pumps.

Annex B contains a form in which are listed the vendor drawing and data requirements (VDDR).

Annex C specifies techniques for pulsation and vibration control.

Annex D contains typical data sheets.

Annex E describes pump system interaction and explains the differences between NPIP and NPSH.

Annex F contains an inspector's checklist.

Annex G specifies requirements for the lubrication system.

## 1 Scope

This International Standard specifies requirements for reciprocating positive-displacement pumps and pump units for use in the petroleum, petrochemical and natural gas industries. It is applicable to both direct-acting and power-frame types.

This International Standard is not applicable to controlled-volume pumps and rotary pumps.

NOTE For controlled-volume pumps see API Std 675; for rotary pumps see API Std 676.

## 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 7 (all parts), *Pipe threads where pressure-tight joints are made on the threads*

ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation*

ISO 261, *ISO general-purpose metric screw threads — General plan*

ISO 262, *ISO general-purpose metric screw threads — Selected sizes for screws, bolts and nuts*

ISO 281, *Rolling bearings — Dynamic load ratings and rating life*

ISO 286-2, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts*

ISO 724, *ISO general-purpose metric screw threads — Basic dimensions*

ISO 965 (all parts), *ISO general-purpose metric screw threads — Tolerances*

ISO 1328-1, *Cylindrical gears — ISO system of accuracy — Part 1: Definitions and allowable values of deviations relevant to corresponding flanks of gear teeth*

ISO 1940-1, *Mechanical vibration — Balance quality requirements of rigid rotors — Part 1: Determination of permissible residual imbalance*

ISO 3448, *Industrial liquid lubricants — ISO viscosity classification*

ISO 5753, *Rolling bearings — Radial internal clearance*

ISO 6708, *Pipework components — Definition and selection of DN (nominal size)*



ISO 7005-1:1992, *Metallic flanges — Part 1: Steel flanges*

ISO 7005-2, *Metallic flanges — Part 2: Cast iron flanges*

ISO 8501-1, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings*

ISO 10438 (all parts), *Petroleum and natural gas industries — Lubrication, shaft-sealing and control-oil systems and auxiliaries*

ISO 13707, *Petroleum and natural gas industries — Reciprocating compressors*

ISO 15649, *Petroleum and natural gas industries — Piping*

IEC 60034 (all parts), *Rotating electrical machines*

IEC 60079 (all parts), *Electrical apparatus for explosive gas atmospheres*

EN 287 (all parts), *Qualification test of welders — Fusion welding<sup>1)</sup>*

EN 288 (all parts), *Specification and approval of welding procedures for metallic materials*

EN 13445 (all parts), *Unfired pressure vessels*

ABMA 7, *Shaft and housing fits for metric radial ball and roller bearings (except tapered roller bearings) conforming to basic boundary plan<sup>2)</sup>*

AGMA 2015-1, *Accuracy classification system — Tangential measurements for cylindrical gears<sup>3)</sup>*

AGMA 6010, *Standard for spur, helical, herringbone, and bevel enclosed drives*

AGMA 6091, *Standard for gearmotor, shaft mounted and screw conveyor drives*

AGMA 9002, *Bores and keyways for flexible couplings (inch series)*

API Std 526, *Flanged steel pressure relief valves<sup>4)</sup>*

API Std 541, *Form-wound squirrel cage induction motors — 250 horsepower and larger*

API Std 546, *Brushless synchronous machines — 500 kVA and larger*

API Std 611, *General-purpose steam turbines for petroleum, chemical, and gas industry services*

API Std 677, *General-purpose gear units for petroleum, chemical and gas industry services*

API RP 686, *Machinery installation and installation design*

ASA S2.19, *Mechanical vibration — Balance quality requirements of rigid rotors — Part 1: Determination of permissible residual unbalance, including marine applications<sup>5)</sup>*

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1) Comité Européen de Normalisation, 36, rue de Stassart, B-1050 Brussels, Belgium.

2) American Bearing Manufacturers Association, 2025 M Street, NW, Suite 800, Washington, DC 20036, USA.

3) American Gear Manufacturers Association, 1500 King Street, Suite 201, Alexandria, VA 22314, USA.

4) American Petroleum Institute, 1220 L Street NW, Washington, DC 20005-4070, USA.

5) Acoustical Society of America, 35 Pinelawn Road, Suite 114 East, Melville, NY 11747, USA.

ASME Boiler and pressure vessel code, Section V, *Non-destructive examination*<sup>6)</sup>

ASME Boiler and pressure vessel code, Section VIII, *Rules for construction of pressure vessels, division 1*

ASME Boiler and pressure vessel code, Section IX, *Welding and brazing qualifications*

ASME B1.1, *Unified inch screw threads, UN and UNR thread form*

ASME B16.1, *Cast iron pipe flanges and flanged fittings classes 25, 125 and 250*

ASME B16.5, *Pipe flanges and flanged fittings NPS 1/2 through NPS 24*

ASME B16.11, *Forged fittings socket welding and threaded*

ASME B16.42, *Ductile iron pipe flanges and flanged fittings classes 150 and 300*

ASME B16.47, *Large diameter steel flanges NPS 26 through NPS 60*

AWS D1.1, *Structural welding code — Steel*<sup>7)</sup>

DIN 910, *Heavy-duty hexagon head screw plugs*<sup>8)</sup>

HI 6.6, *Reciprocating pump tests*<sup>9)</sup>

HI 8.1-8.5, *Direct acting (steam) pumps — Nomenclature, definitions, applications, and operation*

IEEE 841, *Standard for the petroleum and chemical industry — Severe duty totally enclosed fan-cooled (TEFC) squirrel cage induction motors — up to and including 370 kW (500 hp)*<sup>10)</sup>

NACE MR0175, *Sulfide stress cracking resistant metallic materials for oilfield equipment*<sup>11)</sup>

NFPA 70:2002, *National Electrical Code*<sup>12)</sup>

SSPC SP 6, *Surface preparation specification*<sup>13)</sup>

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6) American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990, USA.

7) American Welding Society, 550 North LeJeune Road, Miami, FL 33136, USA.

8) Deutsches Institut für Normung E.V., Burggrafenstrasse 6, 10787 Berlin, Germany.

9) Hydraulics Institute, 9 Sylvan Way, Parsippany, NJ 07054, USA.

10) Institute of Electrical & Electronics Engineers, 445 Hoes Lane, Piscataway, NJ 08855-1331, USA.

11) National Association of Corrosion Engineers, 1440 South Creek Drive, Houston, TX 77084-4906, USA.

12) National Fire Protection Association, 1 Battery March Park, Quincy, MA 02269-9101, USA.

13) Society for Protective Coatings, 40 24th Street, 6th Floor, Pittsburgh, PA 15222-4643, USA.