

Tsentrifugaalpumpade tehnilised andmed. Klass I

Technical specifications for centrifugal pumps - Class I
(ISO 9905:1994)

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 9905:1999 sisaldab Euroopa standardi EN ISO 9905:1997+AC:2006 ingliskeelset teksti.</p> <p>Standard on jõustunud sellekohase teate avaldamisel EVS Teatajas.</p> <p>Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 22.10.1997.</p> <p>Standard on kättesaadav Eesti Standardikeskusest.</p>	<p>This Estonian standard EVS-EN ISO 9905:1999 consists of the English text of the European standard EN ISO 9905:1997+AC:2006.</p> <p>This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.</p> <p>Date of Availability of the European standard is 22.10.1997.</p> <p>The standard is available from the Estonian Centre for Standardisation.</p>
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ICS 23.080.00

Descriptors: see ISO document

English version

Technical specifications for centrifugal pumps - Class I (ISO
9905:1994)

Spécifications techniques pour pompes centrifuges -
Classe I (ISO 9905:1994)

Kreiselpumpen technische Anforderungen - Klasse I (ISO
9905:1994)

This European Standard was approved by CEN on 18 September 1997.

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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
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

The text of the International Standard from Technical Committee ISO/TC 115 "Pumps" of the International Organization for Standardization (ISO) has been taken over as an European Standard by Technical Committee CEN/TC 197 "Pumps", 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of an identical text or by endorsement, at the latest by April 1998, and conflicting national standards shall be withdrawn at the latest by April 1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 9905:1994 has been approved by CEN as a European Standard without any modification.

NOTE: Normative references to International Standards are listed in annex ZA (normative).

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Annex ZA (normative)
Normative references to international publications
with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 544	1989	Filler materials for manual welding - Size requirements	EN 20544	1991
ISO 2858	1975	End-suction centrifugal pumps (rating 16 bar) - Designation, nominal duty point and dimensions	EN 22858	1993
ISO 3744	1994	Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering method in an essentially free field over a reflecting plane	EN ISO 3744	1995
ISO 3746	1995	Acoustics - Determination of sound power levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane	EN ISO 3746	1995

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International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

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.

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.

International Standard ISO 9905 was prepared by Technical Committee ISO/TC 115, *Pumps*, Subcommittee SC 1, *Dimensions and technical specifications of pumps*.

Annexes A, B, C and D form an integral part of this International Standard. Annexes E, F, G, H, J, K and L are for information only.

Introduction

This International Standard is the second of a set dealing with technical specifications of centrifugal pumps; the specifications are designated as Classes I, II and III. Class I (this International Standard) comprises the most severe and Class III (see ISO 9908) the least severe requirements. For requirements for Class II centrifugal pumps, see ISO 5199.

The selection of the class to be used is made in accordance with the technical requirements for the application for which the pump is intended.

The class chosen is to be agreed between purchaser and manufacturer/supplier.

The safety requirements of the field of application are furthermore to be taken into account.

However, it is not possible to standardize the class of technical requirements for centrifugal pumps for a certain field of application, because each field of application comprises different requirements. All classes (I, II and III) can be used in accordance with the different requirements of the pump application, e.g. for an oil refinery plant, chemical plant or power plant. It may happen that pumps built in accordance with classes I, II and III may work beside each other in one plant.

Conditions covering specific applications or industrial requirements are dealt with in separate standards.

Criteria for the selection of a pump of the class required for a certain application may be based on:

- reliability,
- operating conditions,
- environmental conditions,
- local ambient conditions.

Throughout this International Standard, text written in bold letters indicates where a decision may be required by purchaser, or where agreement is required between purchaser and manufacturer/supplier.

Technical specifications for centrifugal pumps — Class I

1 Scope

1.1 This International Standard covers the Class I (most severe) requirements for centrifugal pumps used in various industries. It consists of a basic text covering general requirements. The technical requirements refer only to the pump unit.

Storage pumps are not included in this International Standard. A separate standard will be issued by IEC.

1.2 This International Standard includes design features concerned with installation, maintenance and safety of such pumps, including baseplate, coupling and auxiliary piping.

1.3 Where this International Standard specification has been called for:

- a) and requires a specific design feature, alternative designs may be offered which meet the intent of this International Standard, provided that the alternative is described in detail;
- b) pumps not complying with all requirements of this International Standard may be offered for consideration, provided that all deviations are stated.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements

based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7-1:1982, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Designation, dimensions and tolerances.*

ISO 76:1987, *Rolling bearings — Static load ratings.*

ISO 185:1988, *Grey cast iron — Classification.*

ISO 228-1:1982, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Designation, dimensions and tolerances.*

ISO 281:1990, *Rolling bearings — Dynamic load ratings and rating life.*

ISO 427:1983, *Wrought copper-tin alloys — Chemical composition and forms of wrought products.*

ISO 544:1989, *Filler materials for manual welding — Size requirements.*

ISO 1940-1:1986, *Mechanical vibration — Balance quality requirements of rigid rotors — Part 1: Determination of permissible residual unbalance.*

ISO 2372:1974, *Mechanical vibration of machines with operating speeds from 10 to 200 rev/s — Basis for specifying evaluation standards.*

ISO 2548:1973, *Centrifugal, mixed flow and axial pumps — Code for acceptance tests — Class C (It is planned to combine ISO 2548 with ISO 3555 during their next revision to create a new International Standard).*

ISO 2858:1975, *End-suction centrifugal pumps (rating 16 bar) — Designation, nominal duty point and dimensions.*

ISO 3069:1974, *End suction centrifugal pumps — Dimensions of cavities for mechanical seals and for soft packing.*

ISO 3274:1975, *Instruments for the measurement of surface roughness by the profile method — Contact (stylus) instruments of consecutive profile transformation — Contact profile meters, system M.*

ISO 3506:1979, *Corrosion-resistant stainless steel fasteners — Specifications.*

ISO 3555:1977, *Centrifugal, mixed flow and axial pumps — Code for acceptance tests — Class B (It is planned to combine ISO 3555 with ISO 2548 during their next revision to create a new International Standard).*

ISO 3744:1981, *Acoustics — Determination of sound power levels of noise sources — Engineering methods for free-field conditions over a reflecting plane.*

ISO 3746:1979, *Acoustics — Determination of sound power levels of noise sources — Survey method.*

ISO 3755:1991, *Cast carbon steels for general engineering purposes.*

ISO 4863:1984, *Resilient shaft couplings — Information to be supplied by users and manufacturers.*

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

ISO 7005-2:1988, *Metallic flanges — Part 2: Cast iron flanges.*

ISO 7005-3:1988, *Metallic flanges — Part 3: Copper alloy and composite flanges.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 normal conditions: Conditions at which usual operation is expected.

3.2 rated conditions: Specified guarantee-point operating conditions, including flowrate, head, power, efficiency, net positive suction head, suction pressure, temperature, density, viscosity and speed.

3.3 operating conditions: All operating parameters (for example temperature, pressure) determined by a given application and pumped liquid.

These parameters will influence the type of construction materials.

3.4 allowable operating range: Flow range, defined by the manufacturer/supplier, at the specified operating conditions using the impeller supplied, as limited by cavitation, heating, vibration, noise, shaft deflection and other similar criteria; range whose upper and lower limits are denoted by maximum and minimum continuous flow, respectively.

3.5 maximum allowable casing working pressure: Greatest outlet pressure at the specified operating temperature for which the pump casing is suitable.

3.6 basic design pressure: Pressure derived from the permitted stress at 20 °C of the material used for the pressure-containing parts.

3.7 maximum outlet working pressure: Sum of the maximum inlet pressure plus maximum differential pressure at rated conditions using the supplied impeller.

3.8 rated outlet pressure: Outlet pressure of the pump at the guarantee point with rated flow, rated speed, rated inlet pressure and density.

3.9 maximum inlet pressure: Highest inlet pressure to which the pump is subjected during operation.

3.10 rated inlet pressure: Inlet pressure for the operating conditions at the guarantee point.

3.11 maximum allowable temperature: Highest allowable continuous temperature for which the equipment (or any part to which the term refers) is suitable when handling the specified operating fluid at the specified operating pressure.

3.12 rated power input: Power required by the pump at the rated conditions.

3.13 maximum dynamic sealing pressure: Highest pressure expected at the shaft seals during any specified operating condition and during startup and shutdown.

NOTE 1 In determining this pressure, consideration should be given to the maximum inlet pressure, circulation or injection (flush) pressure and the effect of internal clearance changes.