SLOVENSKI STANDARD
SIST EN ISO 15783:2004

01-september-2004

Centrifugalne ļ rpalke brez tesnila (hermetiļ ne ļ rpalke) ï Razred II ï Specifikacija (ISO 15783:2002)

Seal-less rotodynamic pumps - Class II - Specification (ISO 15783:2002)

Wellendichtungslose Kreiselpumpen - Klasse ll - Technische Anforderungen (ISO 15783:2002)

Pompes rotodynamiques sans dispositif d'étanchéité d'arbre - Classe II - Spécifications (ISO 15783:2002)

Ta slovenski standard je istoveten z: EN ISO 15783:2003

ICS:

23.080	Ļ rpalke	Pumps

SIST EN ISO 15783:2004 en

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 15783

March 2003

ICS 23.080

English version

Seal-less rotodynamic pumps - Class II - Specification (ISO 15783:2002)

Pompes rotodynamiques sans dispositif d'étanchéité d'arbre - Classe II - Spécifications (ISO 15783:2002)

This European Standard was approved by CEN on 9 January 2003.

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 Management Centre 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN ISO 15783:2003 E

Foreword

The text of ISO 15783:2002 has been prepared by Technical Committee ISO/TC 115 "Pumps" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 15783:2003 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 September 2003, and conflicting national standards shall be withdrawn at the latest by September 2003.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of ISO 15783:2002 has been approved by CEN as EN ISO 15783:2003 without any modifications.

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

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 are 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 (including amendments).

NOTE Where an International Publication has been modified by common modifications, indicated by (mod.), the relevant EN/HD applies.

Publication	Year	Title	EN	Year
ISO 3274	1996	Geometrical product specifications (GPS) - Surface texture: Profile method - Nominal characteristics of contact (stylus)	EN ISO 3274	1997
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
ISO 5199	1986	Technical specifications for centrifugal pumps - Class II	EN 25199	1992
ISO 9906	1999	Rotodynamic pumps - Hydraulic performance acceptance tests - Grades 1 and 2	EN ISO 9906	1999

INTERNATIONAL STANDARD

ISO 15783

First edition
2002-02-01

Seal-less rotodynamic pumps — Class II — Specification

Pompes rotodynamiques sans dispositif d'étanchéité d'arbre — Classe II — Spécifications

Reference number
ISO 15783:2002(E)

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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 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15783 was prepared by Technical Committee ISO/TC 115, *Pumps*, Subcommittee SC 1, *Dimensions and technical specifications of pumps*.

Annex A forms a normative part of this International Standard. Annexes B, C, D, E, F and G are for information only.

Introduction

This International Standard is the first of a series dealing with technical specifications for seal-less pumps; they correspond to two classes of technical specifications, Classes I and II, of which Class I is the more severe requirements.

Where a decision may be required by the purchaser, or agreement is required between the purchaser and manufacturer/supplier, the relevant text is highlighted with • and is listed in annex G.

Seal-less rotodynamic pumps — Class II — Specification

1 Scope

1.1 This International Standard specifies the requirements for seal-less rotodynamic pumps that are driven with permanent magnet coupling (magnet drive pumps) or with canned motor, and which are mainly used in chemical processes, water treatment and petrochemical industries. Their use can be dictated by space, noise, environment or safety regulations.

Seal-less pumps are pumps where an inner rotor is completely contained in a pressure vessel holding the pumped fluid. The pressure vessel or primary containment device is sealed by static seals such as gaskets or O-rings.

1.2 Pumps will normally conform to recognized standard specifications (e.g. ISO 5199, explosion protection, electromagnetic compatibility), except where special requirements are specified herein.

1.3 This International Standard includes design features concerned with installation, maintenance and operational safety of the pumps, and defines those items to be agreed upon between the purchaser and manufacturer/supplier.

1.4 Where conformity to this International Standard has been requested and calls for a specific design feature, alternative designs may be offered providing that they satisfy the intent of this International Standard and they are described in detail. Pumps which do not conform with all requirements of this International Standard may also be offered providing that the deviations are fully identified and described.

Whenever documents include contradictory requirements, they should be applied in the following sequence of priority:

a) purchase order (or inquiry, if no order placed), see annexes D and E;

b) data sheet (see annex A) or technical sheet or specification;

c) this International Standard;

d) other standards.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 76, *Rolling bearings — Static load ratings*

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

ISO 3274, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Nominal characteristics of contact (stylus) instruments*

ISO 3744, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane*

ISO 3746, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane*

ISO 5199, *Technical specifications for centrifugal pumps — Class II*

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

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

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

ISO 9906, *Rotodynamic pumps — Hydraulic performance acceptance tests — Grades 1 and 2*

IEC 60034-1, *Rotating electrical machines — Part 1: Rating and performance*

EN 12162, *Liquid pumps — Safety requirements — Procedure for hydrostatic testing*

3 Terms and definitions

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

3.1
magnetic drive pump
MDP
pump in which the shaft power of the drive is transferred to the impeller of the pump by means of a permanent magnetic field, which passes through a containment barrier (shell) to an inner rotor having permanent magnets or an induction device

3.2
canned motor pump
CMP
pump in which the stator of an electric motor is separated from the rotor by a sealed containment barrier (liner)

NOTE 1 The rotor runs in the liquid being pumped or in another liquid.

NOTE 2 The shaft power is transmitted by means of an electromagnetic field.

3.3
seal-less rotodynamic pump
⟨general⟩ pump design in which the impeller shaft also carries the rotor of either a canned induction motor or a synchronous or an asynchronous magnetic drive

NOTE The design does not use a dynamic shaft seal as a primary containment device. Static seals are the means used for containing the fluid.

3.3.1
hydraulic end
that end of the pump which transfers mechanical energy into the liquid being pumped

3.3.2
power drive end
that end of the pump containing the magnetic coupling (MDP) or the motor (CMP) which provides the mechanical energy necessary for the operation of the hydraulic end

3.3.3
lubrication and cooling flow
flow necessary in a magnetic drive in the area between the inner magnet and the containment shell, or in a canned motor between the rotor and the sleeve, for dissipation of the heat due to inherent eddy current losses in metallic containment shells and frictional heat generation from bearings, and for lubrication

NOTE Internal pump bearings are lubricated and cooled by the pumped fluid or an external, compatible flushing fluid.

3.3.4
close coupled
⟨MDP⟩ coupling arrangement in which the motor is supplied with a flange adapter which mounts directly onto the casing or body of the pump and in which the outer magnet ring is mounted onto the motor shaft

3.3.5
separately coupled
⟨MDP⟩ arrangement in which the motor and pump have separate mounting arrangements with the outer magnet ring mounted on its own shaft, supported by rolling bearings, and connected to the motor shaft by means of a flexible coupling

3.3.6
air gap
⟨MDP⟩ radial distance between the inner diameter (ID) of the outer magnet assembly and the outer diameter (OD) of the containment shell

3.3.7
liquid gap
⟨MDP⟩ radial distance between the ID of the shell and the OD of the rotor sheath

3.3.8
liquid gap
⟨CMP⟩ radial distance between the ID of the liner and the OD of the rotor sheath

3.3.9
total gap
magnetic gap
⟨MDP⟩ radial distance between the ID of the outer magnets and the OD of the inner magnets/torque ring

3.3.10
total gap
magnetic gap
⟨CMP⟩ total distance between the ID of the stator laminations and the OD of the rotor lamination

3.3.11
radial load
⟨MDP and CMP⟩ load perpendicular to the pump shaft and drive shaft due to unbalanced hydraulic loading on the impeller, mechanical and magnetic rotor unbalance, rotor assembly weight, and forces of the fluid circulating through the drive

3.3.12
axial load
⟨MDP⟩ load in line with the pump shaft caused by hydraulic forces acting on the impeller shrouds and inner magnet assembly

3.3.13
axial load
⟨CMP⟩ load in line with the pump shaft caused by hydraulic forces acting on the impeller shrouds and rotor

