International Standard

ISO 15783

Seal-less rotodynamic pumps — Class II — Specification

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

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 115, *Pumps,* Subcommittee SC 1, *Dimensions and technical specifications of pumps*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 197, *Pumps*,in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 15783:2002), which has been technically revised. It also incorporates the Amendment ISO 15783:2002/Amd.1:2008.

The main changes are as follows:

— Normative references were extensively revised. Some references have been updated.

— Liquid properties were added in 4.2.1.

— Definition of rigid support added in Note of Table 1.

— Annex F was extensively revised. Hastelloy alloy was also added to Table F.1.

— 4.13.1 and 4.13.3 were added to Annex G;

— Bibliography was extensively revised.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document 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.

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Seal-less rotodynamic pumps — Class II — Specification

1 Scope

This document 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.

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

This document 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.

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

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

a) purchase order (or inquiry, if no order placed), see Annexes C and D;

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

c) this document;

d) other standards.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 76, *Rolling bearings — Static load ratings*

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

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

ISO 3746, *Acoustics — Determination of sound power levels and sound energy 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, *Pipe flanges — Part 1: Steel flanges for industrial and general service piping systems*

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

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

ISO 9906, *Rotodynamic pumps — Hydraulic performance acceptance tests — Grades 1, 2 and 3*

ISO 25178-601, *Geometrical product specifications (GPS) — Surface texture: Areal — Part 601: Design and characteristics of contact (stylus) instruments*

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

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

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

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 to entry: The rotor runs in the liquid being pumped or in another liquid.

Note 2 to entry: The shaft power is transmitted by means of an electromagnetic field.

3.3
seal-less rotodynamic pump
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 1 to entry: 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
end of the pump which transfers mechanical energy into the liquid being pumped

3.3.2
lubrication
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 1 to entry: Internal pump bearings are lubricated and cooled by the pumped fluid or an external, compatible flushing fluid.

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