SLOVENSKI STANDARD
oSIST prEN ISO 10439-2:2010

01-december-2010

Petrokemična industrija ter industrija za predelavo nafte in zemeljskega plina - Aksialni, radialni in ekspanzijski kompresorji - 2. del: Radialni in aksialni kompresorji brez vključenega pogona (ISO/DIS 10439-2:2010)

Petroleum, petrochemical and natural gas industries - Axial and centrifugal compressors and expander-compressors - Part 2: Non-integrally geared centrifugal and axial compressors (ISO/DIS 10439-2:2010)

Erdöl-, petrochemische und Erdgasindustrie - Axial- und Radialkompressoren und Expanderkompressoren für Sonderanwendungen zur Handhabung von Gas oder Prozessluft - Teil 2: Radial- und Axialkompressoren ohne integrierte Getriebeeinheit (ISO/DIS 10439-2:2010)

Industries du pétrole, de la pétrochimie et du gaz naturel - Compresseurs axiaux et centrifuges et compresseurs-détenteurs - Partie 2: Compresseurs centrifuges et axiaux sans multiplicateur intégré (ISO/DIS 10439-2:2010)

Ta slovenski standard je istoveten z: **prEN ISO 10439-2**

ICS:

23.140	Kompresorji in pnevmatični stroji	Compressors and pneumatic machines
75.180.20	Predelovalna oprema	Processing equipment

oSIST prEN ISO 10439-2:2010 **en,fr**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN ISO 10439-2

October 2010

ICS 71.120.99; 75.180.20

Will supersede EN ISO 10439:2002

English Version

Petroleum, petrochemical and natural gas industries - Axial and centrifugal compressors and expander-compressors - Part 2: Non-integrally geared centrifugal and axial compressors (ISO/DIS 10439-2:2010)

Industries du pétrole, de la pétrochimie et du gaz naturel - Compresseurs axiaux et centrifuges et compresseurs-détenteurs - Partie 2: Compresseurs centrifuges et axiaux sans multiplicateur intégré (ISO/DIS 10439-2:2010)

Erdöl-, petrochemische und Erdgasindustrie - Axial- und Radialkompressoren und Expanderkompressoren für Sonderanwendungen zur Handhabung von Gas oder Prozessluft - Teil 2: Radial- und Axialkompressoren ohne integrierte Getriebeeinheit (ISO/DIS 10439-2:2010)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 12.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, 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.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. prEN ISO 10439-2:2010: E

Contents

Page

Foreword

This document (prEN ISO 10439-2:2010) has been prepared by Technical Committee ISO/TC 118 "Compressors and pneumatic tools, machines and equipment" 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 document is currently submitted to the parallel Enquiry.

This document will supersede EN ISO 10439:2002.

Endorsement notice

The text of ISO/DIS 10439-2:2010 has been approved by CEN as a prEN ISO 10439-2:2010 without any modification.

DRAFT INTERNATIONAL STANDARD ISO/DIS 10439-2

ISO/TC **118**/SC **1** Secretariat: **NEN**

Voting begins on: **2010-10-07**

Voting terminates on: **2011-03-07**

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Petroleum, petrochemical and natural gas industries — Axial and centrifugal compressors and expander-compressors —

Part 2:

Non-integrally geared centrifugal and axial compressors

Industries du pétrole, de la pétrochimie et du gaz naturel — Compresseurs axiaux et centrifuges et compresseurs-détenteurs —

Partie 2: Compresseurs centrifuges et axiaux sans multiplicateur intégré

(Revision in part of ISO 10439:2002)

ICS 71.120.99; 75.180.20

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO-lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

Contents

Page

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.

ISO 10439-2 was prepared by Technical Committee ISO/TC 118, *Petroleum and natural gas industries*, Subcommittee SC 1, *Axial and centrifugal compressors and Expander-compressors* in collaboration with Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 6, *Processing equipment and systems*.

This second edition cancels and replaces the first edition (ISO 10439:2002), which has been technically revised and split into four (4) parts.

ISO 10439 consists of the following parts, under the general title *Axial and centrifugal compressors and expander-compressors for special purpose applications handling gas of process air for petroleum, petrochemical and natural gas industries:*

Part 1: General requirements

Part 2: Non-integrally geared centrifugal and axial compressors

Part 3: Integrally geared centrifugal compressors

Part 4: Expander-compressors

Introduction

This International Standard is based on the 7th edition of the American Petroleum Institute standard API 617.

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.

A Bullet (•) at the beginning of a clause or subclause indicates that either a decision is required or further information is to be provided by the purchaser. This information should be indicated on data sheets or stated in the enquiry or purchase order (see examples in ISO 10439-2 Annex A, ISO 10439-3 Annex A and ISO 10439-4 Annex A).

In this International Standard, where practical, US Customary units are included in parentheses for information.

Petroleum, petrochemical and natural gas industries — Axial and centrifugal compressors and expander-compressors —

Part 2:

Non-integrally geared centrifugal and axial compressors

1 Scope

This International standard specifies minimum requirements and gives recommendations for axial compressors, single-shaft and integrally geared process centrifugal compressors and expander-compressors for special purpose applications that handle gas or process air in the petroleum, petrochemical and natural gas industries. This part of ISO 10439 specifies requirements for non-integrally geared centrifugal and axial compressors, in addition to the general requirements specified in ISO 10439-1. These machines do not have gears integral with their casing but can have external gears.

NOTE See ISO 10439-3 for integrally geared process compressors, or API Std 672 for packaged plant instrument air compressors.

2 Normative references

The following referenced documents are indispensible for the application of this document. For dated references, only the editions cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10439-1:2010 *Petroleum, Petrochemical and natural gas industries – Axial and Centrifugal Compressors and Expander-compressors – Part 1: General requirements*

ISO 10438:2007 (all parts), *Petroleum, petrochemical and natural gas industries – Lubrication, shaft-seating and oil-control systems and auxiliaries.* (identical to API STD 614 5th edition)

ISO 5389*,Turbocompressors – Performance test code.*

API STD 670:2000, *Machinery Protection Systems.*

ASME PTC 10-1997, *Performance Test Code on Compressors and Exhausters.*

3 Terms, Abbreviated terms and definitions

For the purposes of this document, the terms, abbreviated terms and definitions given in ISO 10439-1 apply.

NOTE Figure 1 is a typical operating map for a centrifugal compressor. Figures 2 and 3 are typical operating maps for an axial compressor. Certain terms are depicted graphically in these figures.

4 General

4.1 Dimensions and units

The dimensional and unit requirements of 10439-1 shall apply.

4.2 Statutory requirements

The statutory requirements of 10439-1 shall apply.

4.3 Unit responsibility

The unit responsibilities of ISO 10439-1 shall apply.

4.4 Basic Design

4.4.1 Performance

4.4.1.1 The sectional head-capacity characteristic curve shall rise continuously from the rated point to predicted surge. The compressor, without the use of a bypass, shall be suitable for continuous operation at any capacity at least 10 percent greater than the predicted surge capacity shown in the proposal.

4.4.1.2 The vendor shall provide an overload limit for axial compressors to avoid damaging blade stresses.

4.5 Materials

Materials shall be in accordance with 4.5 of ISO 10439-1.

NOTE Refer to Annex D for typical materials.

4.6 Casings

Casings shall be in accordance with 4.6 of ISO 10439-1 and 4.6.1 through 4.6.6, as follows.

4.6.1 Pressure-containing Casings

4.6.1.1 The purchaser will specify the relief valve set pressure. The maximum allowable working pressure of the casing shall be at least equal to the specified relief valve set pressure.

4.6.1.1.1 When a relief valve set pressure is not specified, the maximum allowable working pressure shall be at least 125 percent of the maximum specified discharge pressure (gauge). System protection shall be furnished by the purchaser.

4.6.1.2 Casings designed for more than one maximum allowable pressure level (split pressure-level casings) are permitted only in process air service with an atmospheric pressure inlet. Split pressure-level casings are not permitted in other services unless specifically approved by the purchaser. If approved, the vendor shall define the physical limits and the maximum allowable working pressure of each section of the casing.

4.6.1.3 Unless otherwise specified, casings shall be radially split when the partial pressure of hydrogen (at maximum allowable working pressure) exceeds 1380 kPa gauge (200 psi gauge). The partial pressure of hydrogen shall be calculated by multiplying the highest specified mole (volume) percent of hydrogen by the maximum allowable working pressure.

4.6.1.4 Each axially split casing shall be sufficiently rigid to allow removal and replacement of its upper half without disturbing rotor-to-casing running clearances and bearing alignment.

4.6.1.5 Axially split casings shall use a metal-to-metal joint (with a suitable joint compound compatible with the process gas) that is tightly maintained by suitable bolting. Gaskets (including string type) shall not be used on the axial joint. O-rings retained in grooves machined into the flange facing of an axially split casing joint may be used with purchaser's approval.

4.6.1.6 Radially split casings normally use "O" rings, gaskets or other sealing devices between the end head(s) and cylinder. These devices shall be confined in machined grooves, and they shall be made of materials suitable for all specified service conditions.

4.6.1.7 Socket-head, or spanner-type bolting shall not be used externally unless specifically approved by the purchaser.

4.6.2 Casing Repair

Casings repairs shall be in accordance with 4.6.2 of ISO 10439-1.

4.6.3 Material inspection of Pressure Containing Parts

Casings material inspection of pressure containing parts shall be in accordance with 4.6.2 of ISO 10439-1.

4.6.4 Pressure Casing connections

Pressure Casing Connections shall be in accordance with 4.6.4 of ISO 10439-1 and the following paragraphs.

4.6.4.1 Main inlet and outlet connections for radially split machines shall be located in the outer casing, not in the end heads. On radially split overhung design machines, the process inlet connection may be in the end head.