

## **Petroleum, chemical and gas service industries - Packaged, integrally geared centrifugal air compressors**

Petroleum, chemical and gas service industries -  
Packaged, integrally geared centrifugal air  
compressors

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 10442:2003 sisaldab Euroopa standardi EN ISO 10442:2002 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 15.04.2003 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 10442:2003 consists of the English text of the European standard EN ISO 10442:2002.</p> <p>This document is endorsed on 15.04.2003 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>
--	---

<p><b>Käsitlusala:</b></p> <p>This International Standard specifies requirements and gives recommendations for the design, materials, fabrication, inspection, testing and preparation for shipment of constant-speed, packaged, integrally geared centrifugal air compressors, including their accessories, for use in the petroleum, chemical and gas service industries</p>	<p><b>Scope:</b></p> <p>This International Standard specifies requirements and gives recommendations for the design, materials, fabrication, inspection, testing and preparation for shipment of constant-speed, packaged, integrally geared centrifugal air compressors, including their accessories, for use in the petroleum, chemical and gas service industries</p>
--	--

**ICS** 23.140, 75.180.20

**Võtmesõnad:** acces, air compressor, compressed air, compressors, definition, definitions, delivery conditions, displacement compressors, generating sets, natural gas industries, oil industries, refineries, specification (approval), specifications, technical data sheets, testing

ICS 23.140; 75.180.20

English version

**Petroleum, chemical and gas service industries - Packaged,  
integrally geared centrifugal air compressors (ISO 10442:2002)**

Industries du pétrole, de la chimie et du gaz naturel -  
Compresseurs d'air centrifuges assemblés à multiplicateur  
intégrés (ISO 10442:2002)

Erdöl-, Chemie- und Erdgasindustrie – Turbo-  
Luftkompressoranlagen mit integriertem Getriebe  
(ISO 10442:2002)

This European Standard was approved by CEN on 6 November 2002.

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, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, 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

## Contents

Foreword .....	3
Introduction.....	4
1 Scope .....	5
2 Normative references.....	5
3 Terms and definitions .....	6
4 Basic design .....	8
4.1 General .....	8
4.2 Package .....	11
4.3 Integrally geared compressor .....	23
4.4 Driver .....	37
4.5 Driver-to-compressor coupling and guard .....	38
4.6 Intercoolers .....	39
5 Accessories .....	39
5.1 Aftercooler .....	39
5.2 Air intake filter-silencer .....	40
5.3 Discharge blowoff silencer .....	40
6 Inspection, testing and preparation for shipment .....	40
6.1 General .....	40
6.2 Inspection .....	41
6.3 Testing.....	41
6.4 Preparation for shipment.....	44
7 Vendor data .....	45
7.1 Proposals .....	45
7.2 Contract data .....	46
Annex A (informative) Data sheets .....	50
Annex B (informative) Material specifications for major component parts .....	63
Annex C (informative) Diagrams (see ISO 10439).....	64
Annex D (normative) Forces and moments .....	70
Bibliography.....	73

## Foreword

This document (EN ISO 10442:2002) has been prepared by Technical Committee ISO/TC 118 „Compressors, pneumatic tools and pneumatic machines“ in collaboration with Technical Committee CEN/TC 12 „Materials, equipment and offshore structures for petroleum 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 June 2003, and conflicting national standards shall be withdrawn at the latest by June 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, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## Endorsement notice

The text of ISO 10442:2002 has been approved by CEN as EN ISO 10442:2002 without any modifications.

## Introduction

This International Standard is based on the American Petroleum Institute's API Std 672, second edition, April 1988.

Some of the content of this International Standard is identical or similar to ISO 10439, which covers centrifugal compressors for the petroleum, chemical and gas service industries.

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 applicable 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.

## 1 Scope

This International Standard specifies requirements and gives recommendations for the design, materials, fabrication, inspection, testing and preparation for shipment of constant-speed, packaged, integrally geared centrifugal air compressors, including their accessories, for use in the petroleum, chemical and gas service industries. It is also applicable to gas services other than air that are non-hazardous and non-toxic. It is not applicable to machines that develop a pressure rise of less than 35 kPa above atmospheric pressure, which are classed as fans or blowers.

NOTE In this International Standard, where practical, US customary units have been included in brackets for information.

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

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

ISO 3511-1, *Process measurement control functions and instrumentation — Symbolic representation — Part 1: Basic requirements*

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 5389, *Turbocompressors — Performance test code*

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

ISO 9614 (both parts), *Acoustics — Determination of sound power levels of noise sources using sound intensity*

ISO 10436, *Petroleum and natural gas industries — General-purpose steam turbines for refinery service*

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

ISO 10441, *Petroleum and natural gas industries — Flexible couplings for mechanical power transmission — Special purpose applications*

IEC 60079-10, *Electrical apparatus for explosive gas atmospheres — Part 10, Classification of hazardous areas*

ABMA<sup>1)</sup> Std 7, *Shaft and housing fits for metric radial ball and roller bearings (except tapered roller bearings) conforming to basic boundary plan*

ABMA Std 20, *Radial bearings of ball, cylindrical roller and spherical roller types — Metric design*

AGMA<sup>2)</sup> 2000, *Gear classification and inspection handbook*

AGMA 6011, *Specification for High Speed Helical Gear Units*

API Std 670, *Vibration, axial position, and bearing temperature monitoring systems*

API RP 520 PT I, *Sizing, selection, and installation of pressure-relieving devices in refineries, Part I, Sizing and selection*

API RP 520 PT II, *Sizing, selection, and installation of pressure-relieving devices in refineries, Part II, Installation*

ASME<sup>3)</sup> PTC 10, *Performance test code on compressors and exhausters*

ASTM<sup>4)</sup> A275, *Standard test method for magnetic particle examination of steel forgings*

DIN<sup>5)</sup> 3990, *Load calculations for gearings*

NEMA<sup>6)</sup> SM 23, *Steam turbines for mechanical drive service*

TEMA<sup>7)</sup> *Standards of the Tubular Exchanger Manufacturers Association, eight edition*

### 3 Terms and definitions

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

#### 3.1

##### **bull gear**

low-speed rotor of the integral gear

#### 3.2

##### **inlet volume flow**

volume flow rate determined at the conditions of pressure, temperature, compressibility and gas composition, including moisture, at the compressor inlet flange

[ISO 10439:2002, definition 3.5]

---

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

2) American Gear Manufacturers Association, 1500 King St, Suite 201, Alexandria VA 22314, USA.

3) American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017-2392, USA.

4) American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-11887, USA.

5) Deutsches Institut für Normung E.V., Beuth Verlag GmbH, Burggrafenstrasse 6, D10787, Berlin, Germany.

6) US National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, Virginia 22209, USA.

7) US Tubular Exchanger Manufacturers Association, 25 N Broadway, Tarrytown, New York, NY 10007, USA.