

Plahvatusohtlikus keskkonnas töötavate ventilaatorite konstruktsioon

Design of fans working in potentially explosive
atmospheres

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 14986:2007 sisaldab Euroopa standardi EN 14986:2007 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 30.03.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 14986:2007 consists of the English text of the European standard EN 14986:2007.</p> <p>This document is endorsed on 30.03.2007 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>
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<p>Käsitlusala: This European Standard specifies the constructional requirements for fans constructed to Group II G (of explosion groups IIA, IIB and hydrogen) categories 1, 2 and 3, and Group II D categories 2 and 3, intended for use in explosive atmospheres.</p>	<p>Scope: This European Standard specifies the constructional requirements for fans constructed to Group II G (of explosion groups IIA, IIB and hydrogen) categories 1, 2 and 3, and Group II D categories 2 and 3, intended for use in explosive atmospheres.</p>
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ICS 23.120, 29.260.20

Võtmesõnad:

ICS 23.120; 29.260.20

English Version

Design of fans working in potentially explosive atmospheres

Conception des ventilateurs pour les atmosphères
explosibles

Konstruktion von Ventilatoren für den Einsatz in
explosionsgefährdeten Bereichen

This European Standard was approved by CEN on 13 January 2007.

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

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

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

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Foreword

This document (EN 14986:2007) has been prepared by Technical Committee CEN/TC 305 "Potentially explosive atmospheres - Explosion prevention and protection", the secretariat of which is held by DIN.

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 August 2007, and conflicting national standards shall be withdrawn at the latest by August 2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 94/9/EC.

For relationship with EU Directive 94/9/EC, see informative Annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, 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.

Introduction

This European Standard is a type C standard as stated in EN ISO 12100-1.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered and indicated in the scope of this European Standard.

When provisions of this type C standard are different from those, which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

1 Scope

1.1 This European Standard specifies the constructional requirements for fans constructed to Group II G (of explosion groups IIA, IIB and hydrogen) categories 1, 2 and 3, and Group II D categories 2 and 3, intended for use in explosive atmospheres.

NOTE Operation conditions for the different categories of fans used in this European Standard are defined in Clause 4.

1.2 This European Standard does not apply to group I fans (fans for mining), cooling fans or impellers on rotating electrical machines, cooling fans or impellers on internal combustion engines.

NOTE 1 Requirements for group I fans are given in EN 1710.

NOTE 2 The requirements for electrical parts are covered by references to electrical equipment standards.

1.3 This European Standard specifies requirements for design, construction, testing and marking of complete fan units intended for use in potentially explosive atmospheres in air containing gas, vapour, mist and/or dusts. Such atmospheres may exist inside (the conveyed fluid), outside, or inside and outside of the fan.

1.4 This European Standard is applicable to fans working in the range of ambient atmospheres having absolute pressures ranging from 0,8 bar to 1,1 bar, temperatures ranging from $-20\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$, maximum volume fraction of 21 % oxygen content and an aerodynamic energy increase of less than 25 kJ/kg.

NOTE 1 This European Standard may also be helpful for the design, construction, testing and marking of fans intended for use in atmospheres outside the validity range stated above or in cases where other material pairings need to be used. In this case, the ignition risk assessment, ignition protection provided, additional testing (if necessary), manufacturer's marking, technical documentation and instructions to the user, should clearly demonstrate and indicate the equipment's suitability for the conditions the fan may encounter.

NOTE 2 This European Standard does not apply to integral fans of electric motors.

NOTE 3 Where undated references are used in the body of the standard the latest edition applies.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 294, *Safety of machinery — Safety distance to prevent danger zones being reached by the upper limbs*

EN 1050, *Safety of machinery — Principles for risk assessment*

EN 1127-1:1997, *Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology*

EN 12874:2001, *Flame arresters — Performance requirements, test methods and limits for use*

EN 13463-1:2001, *Non-electrical equipment for potentially explosive atmospheres — Part 1: Basic method and requirements*

EN 13463-5, *Non-electrical equipment intended for use in potentially explosive atmospheres — Part 5: Protection by constructional safety "c"*

EN 13463-6, *Non-electrical equipment for use in potentially explosive atmospheres — Part 6: Protection by control of ignition source "b"*

EN 50281-1-1, *Electrical apparatus for use in the presence of combustible dust — Part 1-1: Electrical apparatus protected by enclosures — Construction and testing*

EN 60079-0, *Electrical apparatus for explosive gas atmospheres — Part 0: General requirements (IEC 60079-0:2004)*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN ISO 12100-1, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

EN ISO 12100-2, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles (ISO 12100-2:2003)*

ISO 12499, *Industrial fans — Mechanical safety of fans — Guarding*

ISO 13349:1999, *Industrial fans — Vocabulary and definitions of categories*

ISO 14694:2003, *Industrial fans — Specifications for balance quality and vibration levels*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1127-1:1997, EN 12874:2001 and EN 13463-1:2001 and the following apply.

3.1

externally mounted flame arrester

flame arrester with flame arrester housing and flame arrester elements directly mounted as a separate equipment on the fan

3.2

integrated flame arrester

flame arrester where flame arrester housing and flame arrester elements are part of the fan

3.3

contact diameter

diameter of a rotating part at the point where it can contact a stationary part

4 Requirements for all fans

4.1 General

All fans within the scope of this European Standard shall comply with the requirements contained in EN 13463-1 unless otherwise stated in this European Standard.

NOTE This European Standard deals only with the prevention of ignition of an explosive atmosphere by the fan. Other safety features will need to be incorporated into the construction to meet the requirements of other EU Directives. For example by incorporating the principles of EN ISO 12100 for preventing mechanical hazards, (e.g. guarding to prevent persons contacting rotating parts, sharp edges).

4.2 Ignition hazard assessment

4.2.1 General

A list of hazards which can occur is given in Annex D. Where additional hazards could occur an ignition hazard assessment according to EN 13463-1 shall be carried out.